Euphonix System 5

Digital Audio Mixing System
Operation Manual

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Euphonix

In the interest of continued product development, Euphonix reserves the right to make improvements in this manual and the product it describes at any time, without notice or obligation.

System 5, S5, PatchNet, eMix, EuCon, R1, Studio Hub, Audio Deck, Max Air, Reel Feel, Clear Displays, Track Panner, SnapShot Recal, DSC (Digital Studio Controller), Hyper-Surround, Total Automation and Mix View are trademarks of Euphonix, Inc.

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Manual design by Rob Wenig.

Manual written by Tim Driedger and Rob Wenig.

Note: *This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

Caution: *Any changes or modifications made by the user that are not expressly approved by Euphonix could void the user's right to operate the equipment.*

IMPORTANT SAFETY INSTRUCTIONS

The lighting flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to persons.

The exclamation point within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

1) Read these instructions.

2) Keep these instructions.

3) Heed all warnings.

4) Follow all instructions.

5) Do not use this apparatus near water.

6) Clean only with a dry cloth.

7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11) Only use attachments/accessories specified by the manufacturer.

12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13) Unplug this apparatus during lightning storms or when unused for long periods of time.

14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15) **WARNING** – TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

16) Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.

17) To completely disconnect this equipment from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

18) The mains plug of the power supply cord shall remain readily operable.

19) This unit is provided with a power supply cord set suitable for 120V AC input only (for U.S.A. and Canada). For other than U.S.A. and Canada, a qualified person must provide for use with this unit, an appropriate, approved power supply cord set which is in compliance with the end use country requirements and has a minimum cross-sectional area of 1.0mm^2.

20) For units with more than one power cord:

    Caution: This unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electrical shock.

    Attention: Cet appareil comporte plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher les deux cordons d'alimentation avant de faire le dépannage.

21) Operator Accessible Fuse:

    Caution: For continued protection against risk of fire, replace only with same type and rating of fuse.

    Attention: Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de même caractéristiques nominales.

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Chapter 1: Introduction

Welcome to the System 5, the most advanced digital mixing system available. It has been designed to surpass previous designs to satisfy audio professionals who demand the highest quality audio. The System 5 can handle a large number of digital and analog sources for large projects and has a modular control surface that can be easily configured in many ways. The System 5 digital console is the perfect choice for serious audio production facilities that need a powerful digital mixing system with an easy-to-use interface. The System 5 supports hundreds of inputs, and its busses and panning controls support all current surround formats.

The number of processing cards in the DF64 Digital Core determine the total processing power that can be allocated to channels and busses in each System 5 configuration. A Mixer Model is used to configure the system in the manner best suited for the demands of the session and preferences of the engineer (see *Mixer Model* on page 56 for more details).

Each channel in System 5 shares identical processing features and can be used for microphone, line, or digital inputs as well as audio subgroups and effects returns. The engineer has complete freedom to decide how to route inputs to the console.

PatchNet, a software component of the eMix system, is the digital patchbay that routes signals to and from all Console I/O and all studio devices. All PatchNet settings are saved within Titles and can be quickly recalled.

1.1 How to Use This Manual

Euphonix has dedicated substantial time and resources to the System 5 documentation. We recognize the diverse range of experience among our customers and have written and organized the manual to be accessible to everyone. Of course it is more fun to use System 5 than read about it but we assure you that your time reading this manual will be well spent.

Manual Structure

We recommend that everyone read this introduction in its entirety. The manual contains the following chapters:

- Chapter 2: *New Features in eMix Version 2.7*: Discusses System 5's new features in eMix versions 2.6 and 2.7.
- Chapter 3: *Quickstart to Common Tasks*: Provides the fastest way to begin using System 5's basic features.
- Chapter 4: *eMix Application*: Discusses PatchNet, bus configuration, externals, system configuration, folddown, and diagnostics.
- Chapter 5: *CM401 Master Section*: Discusses System 5's master section including monitoring, communications, solo, and meters.
- Chapter 6: *CM402 Center Section*: Discusses the channel select, knobset select, and bus routing panels.
- Chapter 7: *Busses and Bus Masters*: Discusses the bus masters.
- Chapter 8: *Channels and Strips*: Discusses the physical area of the console used to control channels and the channel processing functions.
- Chapter 9: *Control Groups and Multi Format Masters*: Discusses how to use Control Groups and Multi Format Masters.
- Chapter 10: *Layouts and Snapshots*: Discusses how to store/recall channel-to-strip mappings (layouts) to the console and how to store/recall channel functions (snapshots).
- Chapter 11: *Machine Control*: Discusses the transport and locator controls and track arming.
- Chapter 12: *GPI/O Event System*: Discusses how to use the event system to program System 5.
- Chapter 13: *Dynamic Automation*: Discusses automation record/playback, editing, and performance utilities.
- Chapter 14: *CM403 Film/Post Module*: Discusses the CM403 Film Module.

How to Use the PDF

The Acrobat PDF version of this manual provided in your system can be a valuable "on-line help" learning tool while using System 5. We have included some amenities that we wish to explain for those not familiar with Acrobat:

- The Bookmarks on the left serve as a continuously visible table of contents while reading. Click on a subject heading to jump to that page. Click a + symbol to expand that heading to show subheadings. Click the - symbol to collapse the subheadings.

- The manual's table of contents and list of figures are "active links" to their pages. Select the "hand" cursor, allow it to hover over the heading and turn into a "finger." Then click to locate to that subject and page.

- All cross references are active links. Allow the "hand" cursor to hover over the reference, turn into a "finger," and click to follow the reference.

- Use the left and right arrow keys on the top bar to go back and forth between views. This is a great way to follow a cross reference and return to the page from which you were reading.

- Select the **Find** item from the Edit menu (Ctrl-F) to search for a subject. This can be used as an "index on the fly."

- Use the magnifying glass tool or the zoom edit box on the top bar to zoom in/out. This is helpful when examining a complex graphic or setting the text size for easy reading online.

Acrobat Reader version 4 or later is required to open the PDF. This can be downloaded for free at http://www.adobe.com/products/acrobat/readstep2.html.

1.2 System 5 Hardware

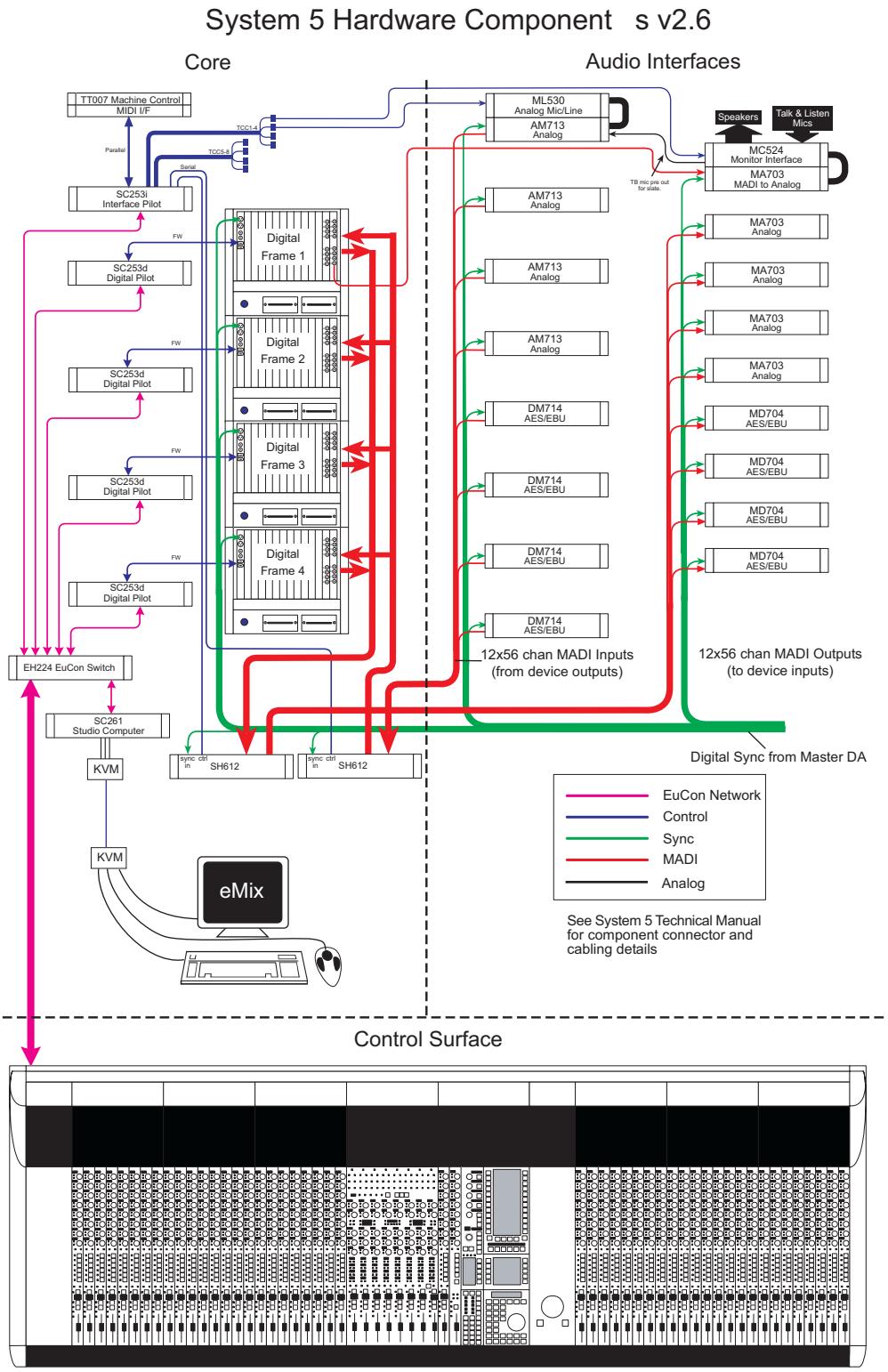


Figure 1-1 System 5 hardware diagram

1.2.1 Overview of System Components

- **Control Surface**: Connects to the processing core via ethernet and the EuCon Hub. Audio does not pass through the control surface.
- **System Computer (SC261)**: Runs the eMix software application; all file management and system setup is done from this computer.
  See Chapter 4: *eMix Application*.
- **Interface Pilot Computer (PC253i)**: Supervises control functions for the analog monitor controller, remote microphone preamps and transport control.
- **Digital Processing Core (DF64)**: The DF64 is the digital audio processing core for System 5. Digital audio is routed to and from the DF64 via MADI.
- **Digital Pilot Computer (PC253d)**: Controls a DF64 digital processing core. There is a Digital Pilot Computer for each DF64 (maximum of four).
- **Studio Hub (SH612)**: One or two of these MADI routers are used to route digital audio to and from the DF64 Digital Cores and the system I/O.
- **System I/O**: Digital and analog I/O units connect all of the devices in the studio to the Studio Hub via MADI. See *Console I/O* on page 46.

1.3 System 5 Startup Sequence

With all system components turned off:

1. Turn on the SC261 System Computer, the SH612 Studio Hub(s), all I/O units, the MIDI Interface, the TT007 and the GP132.
2. At the Windows Login Screen press Ctrl + Alt + Delete and click **OK** or press **Enter**.

   There is no Administrator password.
3. The System Computer will finish booting to the Windows desktop.

With the system computer booted and the SH612 Studio Hub(s), all I/O units, the MIDI Interface, the TT007, and the GP132 turned on:

1. Double-click the **eMix** icon on the desktop.
2. Turn on all of the Surface Modules, the PC253i Interface Pilot, all PC253d digital Pilots and the DF64s.
3. If the modules on the system have previously been saved as default, eMix will continue to boot when all modules reach 100%.
4. If modules appear as **Unexpected**, the user can select all of the modules by holding down the **Ctrl** key and clicking each of them. When all modules are selected, click **Save selected as default**, and confirm the selection by clicking **OK**.
5. Click **Continue** to finish booting eMix.

Chapter 2: New Features in eMix Version 2.7

This section lists new and updated features in the eMix versions 2.6 and 2.7 software. Cross-references link to that feature's discussion in the manual.

Conform

- **Insert**, **Move** and **Delete** operations have been changed so they operate properly on a mix containing virgin territory (no previous automation).
- It is now possible to **Copy** automation moves to a new location.
- Entries can now be edited after they are entered in any field in the list.
- All standard SMPTE frame rates (35 mm Feet+Frames and 16 mm Half-Feet+Frames) can now be entered.
- The entries in the list are now processed in the order entered, not in the order of their timecode.
- New Hot keys have been added to speed data entry and navigation.

(See *Automation Conform* on page 199).

Auto Match

Auto Match is a new automation function.

(See *Auto Match* on page 195).

Fill Start and Fill End

Fill Start and **Fill End** now latch on if pressed twice.

(See Section 13.8.2 - *Fill Start* and *Fill End* on page 189.)

EQ

- All four EQ bands now have a range of 20 Hz – 20 kHz. The default values did not change. Older titles still load with their previous frequency values unchanged. The frequency control range is covered by approximately 2 full knob rotations to maintain the current resolution.
- EQ gain control is now ±24 dB. The resolution remains 1/8 dB increments.

(See *Equalizers and Filters* on page 118.)

Notch Filter

Several improvements have been made to the notch filter.

See *Filters* on page 120.

Extended Delay Time

The delay time has been extended to 2160 samples.

At 48 kHz:

- 45 ms
- NTSC 30 fps = 1.4 frames
- PAL 25 fps =1.1 frames

At 96 kHz:

- 22.5 ms
- NTSC 30 fps = 0.7 frames
- PAL 25 fps =0.6 frames

Channel Path Order

The channel path order selection now includes:

- Fader and Mute
- Delay
- Fader Meter Source
- TFT Meter Source

These changes allow post insert point delay, post fader dynamics, pre-fader metering, and post-fader TFT metering. See page 108 for more information of channel order.

TFT Display Additions

- The CM402 expanded channel now has a clear display of the currently selected channel. The display is the same size/style as the Main Panel names that appear in the lower-right of the CM401 display.
- The CM402 expanded channel now has a clear display of the parameter value of the function being adjusted. This value appears next to the CM402 Channel Name described above.
- The parameter name is now displayed next to screen values during adjustment.
- The parameter value display now shows the function name (i.e., FUNC xxxx).

Surface Changes

- **Mark In/Mark Out** keys have been added to the Transport controls.

  See *Mark In/Mark Out* on page 147.

- Group bus routing can be assigned in pairs from the switch in the center of the knob.
- The label display no longer switches from the fader name to values when touched. The fader name is permanently displayed.
- Timecode entry for all standard SMPTE frames rates and 35/16 mm Feet and Frames.
- Dimming of Knobs and Switches when audio functions are out of circuit.

Transport Return Functionality

Activating the **Return** key cycles between the **Mark In/Mark Out** times.

See *Return Key* on page 148.

Option to Lock Out Control Room and Bus Master Functions

The two buttons below **Mix Master** on the CM401 are now **Bus** and **Monitor Lock**. See *Bus Lock* on page 91.

Knob and Fader Text Displays

There are nine options in the Strips Config Panel to choose between values and names on the text displays for knobs and faders:

- Knobs - momentary, show name or show value
- Fader - momentary, show name or show value
- 402 Faders - momentary, show name or show value

See *Knob and Fader Text Displays* on page 103.

Preview Knobs Only

This automation option allows entering preview mode on the knobs only while writing moves on the faders (see *Preview Knobs Only* on page 193).

Chapter 3: Quickstart to Common Tasks

3.1 Connect and Play a CD

eMix Setup

1. Select **Drives** at the bottom of the eMix screen and choose a drive.
2. Click **Projects->New**, and name the new Project.
3. Click **Titles->New**, and name the new Title.
4. Click **Save the current title and mix data into the new title** to use the current Title's settings for the new Title (like Save As); click **Reset Console with Default Title settings** to use default Title settings.

New Title
Please enter a name for the new title:
CD Player
OK
Cancel
Creation Options:
Save the current title and mix data into the new title
Reset Console with Default Title settings
(Note: Any unsaved changes to the current title & mix will be lost)

Figure 3-1 New Title dialog

Assign Channels to Console

1. Select **Channels** from the main panel viewer in the console master section.
2. Select **Auto** then **Channel 1**.
3. Press **Chan Sel** keys for two neighboring console Strips.

   This assigns Channels 1 and 2 to Strips n and n+1, respectively.

Patch the CD Player

1. Select **PatchNet** from bottom of the eMix screen and select **Console I/O**.
2. Select **A and B Inputs**.
3. Select the blue selection box for the **A Input** of channels 1 and 2.

   The patch points show up in **Selected - Destinations**.

4. Connect the CD's digital output (AES or SDIF) to channels 1 and 2 on the DM714.

   The DM714 should already be connected to SH612 1-1.

5. Select **Device Outputs**, then select **Hub 1-1** from the left of the screen.

6. Under **Device Outputs - Hub1-1**, click in the **Name** column for channel 1 and name the device *CD Player Left;* click in the **Name** column for channel 2 and name it *CD Player Right.*

7. Click the green selection fields to add the patch points to **Selected - Sources.**

8. Click the **Patch** button.

9. Select **Console I/O**, click in the **Name** column for channels 1 and 2 and name them *CDL* and *CDR,* respectively.

10. Press the **Main Panel** key and select **Channels**.

11. Press the **Setup** key and then press **Show Input Names**.

    This displays the input names on the TFT display above the channel.

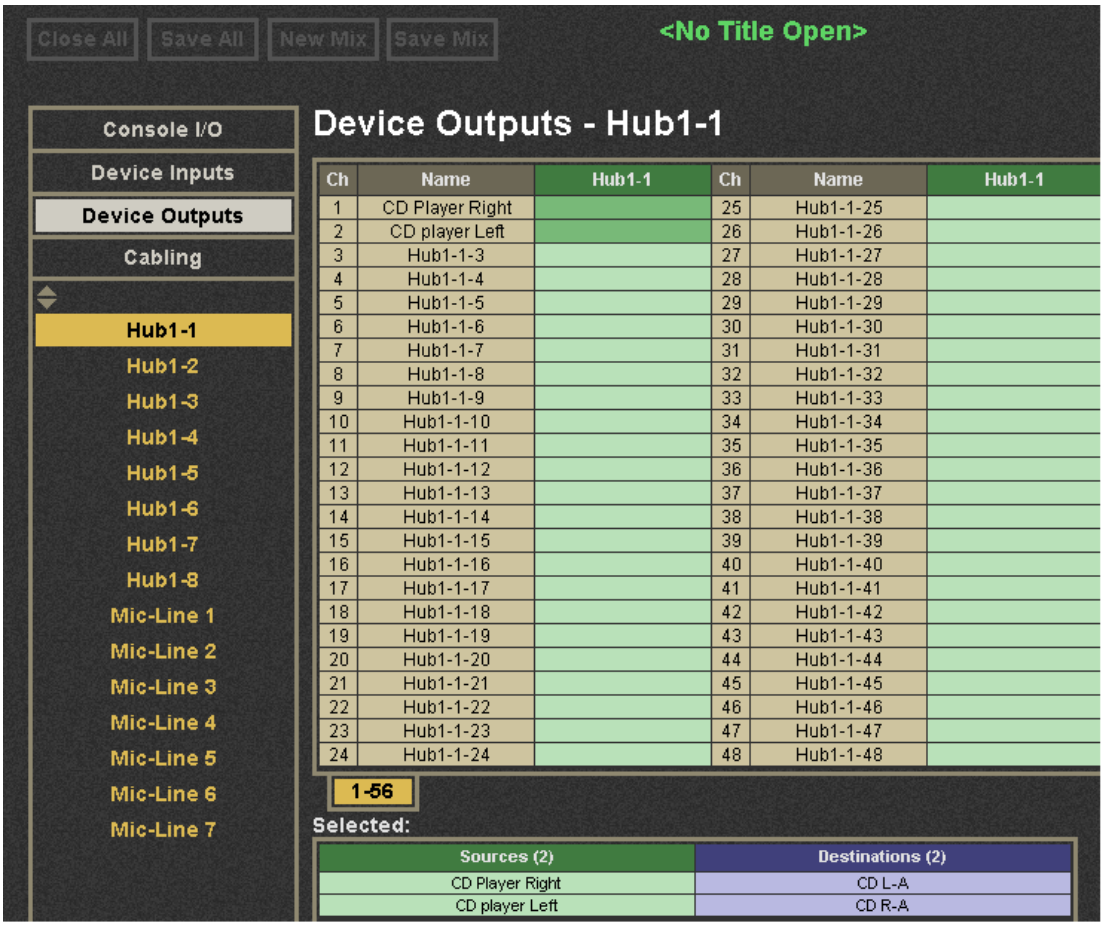

Close All
Save All
New Mix
Save Mix
<No Title Open>
Console I/O
Device Inputs
Device Outputs
Cabling
Hub1-1
Hub1-2
Hub1-3
Hub1-4
Hub1-5
Hub1-6
Hub1-7
Hub1-8
Mic-Line 1
Mic-Line 2
Mic-Line 3
Mic-Line 4
Mic-Line 5
Mic-Line 6
Mic-Line 7
Device Outputs - Hub1-1
Ch | Name | Hub1-1 | Ch | Name | Hub1-1
1 | CD Player Right | 25 | Hub1-1-25
2 | CD player Left | 26 | Hub1-1-26
3 | Hub1-1-3 | 27 | Hub1-1-27
4 | Hub1-1-4 | 28 | Hub1-1-28
5 | Hub1-1-5 | 29 | Hub1-1-29
6 | Hub1-1-6 | 30 | Hub1-1-30
7 | Hub1-1-7 | 31 | Hub1-1-31
8 | Hub1-1-8 | 32 | Hub1-1-32
9 | Hub1-1-9 | 33 | Hub1-1-33
10 | Hub1-1-10 | 34 | Hub1-1-34
11 | Hub1-1-11 | 35 | Hub1-1-35
12 | Hub1-1-12 | 36 | Hub1-1-36
13 | Hub1-1-13 | 37 | Hub1-1-37
14 | Hub1-1-14 | 38 | Hub1-1-38
15 | Hub1-1-15 | 39 | Hub1-1-39
16 | Hub1-1-16 | 40 | Hub1-1-40
17 | Hub1-1-17 | 41 | Hub1-1-41
18 | Hub1-1-18 | 42 | Hub1-1-42
19 | Hub1-1-19 | 43 | Hub1-1-43
20 | Hub1-1-20 | 44 | Hub1-1-44
21 | Hub1-1-21 | 45 | Hub1-1-45
22 | Hub1-1-22 | 46 | Hub1-1-46
23 | Hub1-1-23 | 47 | Hub1-1-47
24 | Hub1-1-24 | 48 | Hub1-1-48
1-56
Selected:
Sources (2)
Destinations (2)
CD Player Right
CD player Left
CD L-A
CD R-A

Figure 3-2 Device Outputs page in PatchNet

Route to the Mix Bus

1. Press the **Channel On** switches for each CD channel.
2. Select the **Mix** button on channels 1 and 2.
3. Select the **In** key of the B Mix Bus; B defaults to 2-channel stereo.
4. In the Master Section, press the **CR Source** key to display the Mix busses in the Panel Viewer. Select the **B Source**.
5. Move the channel 1 and 2 faders up.
6. Press both channel's **Pan** buttons and set to L and R, respectively.
7. In the Master Section, press the **CR Output** key to display the output formats in the Panel Viewer and select **Stereo**.
8. Turn off the **Cut** button and use the **Main Monitor** knob in the Master Section to adjust the control room monitor level.

3.2 Connect and Monitor a Microphone

Configure PatchNet

1. From the left side of PatchNet, select the **Cabling** tab.
2. Select **MADI In Ports** and select **Hub 1-8** (any Hub can be selected).
3. Select **MADI Out Ports** and click in the **MADI Out** column next to Mic 1.

   This tells the SH612 which AM713 is connected to the ML530.
4. Click **Patch**.

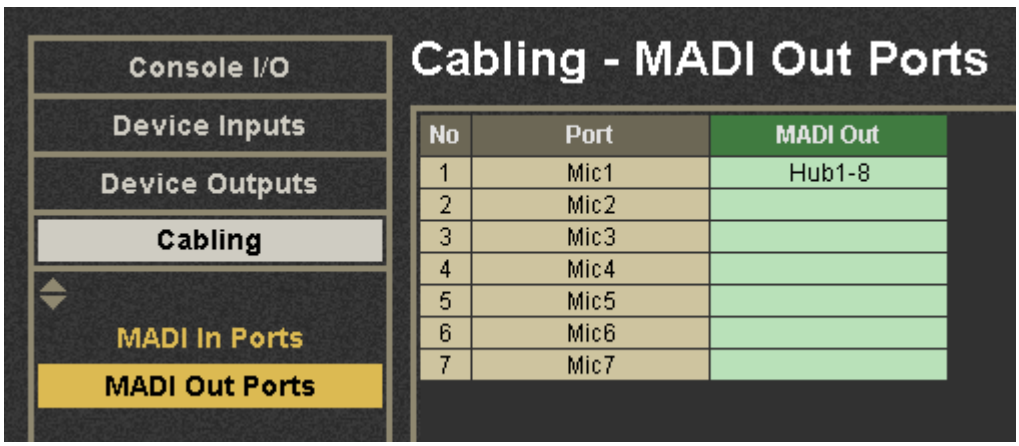


Figure 3-3 Cabling

Assign Channel to Console

1. Select **Channels** from the Main Panel Viewer.
2. Select **Auto** then **Channel 3**.
3. Press the **Chan Sel** key on a Strip.
4. Press the **Inpt** button on the strip, then turn the **Inpt** knob clockwise until the **B input** is selected.
5. Press the ▶ button to display the B input page on the knobset.

Back to PatchNet

1. In PatchNet, select **Console I/O**.
2. Select the B Input of **Channel 3**.
3. Select **Device Outputs**.
4. Select **Mic-Line 1**, **Ch 1**, and name the channel.
5. Click **Patch**.

   The knobs on Channel 3 now display HiZ, 48V, HPF, Gain.

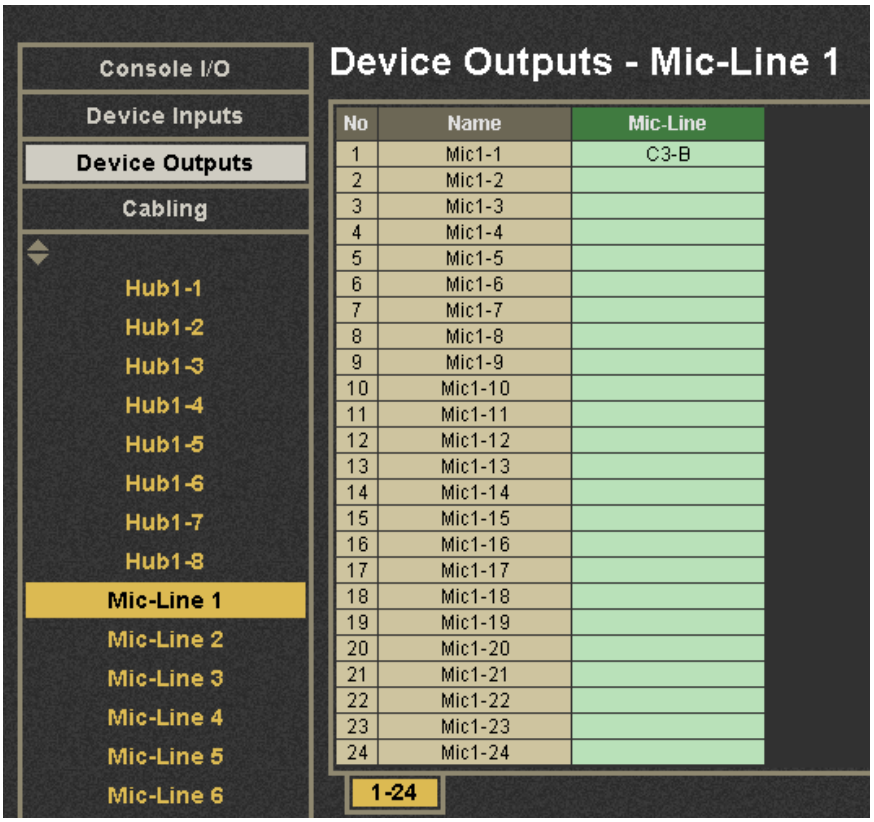


Figure 3-4 Microphone assignment in Device Outputs

Route to the Mix Bus

1. Plug a microphone into Channel 1 of the ML530.
2. To listen to the mic return, press the **Mix** button on channel 3 and select the **In** key of the B Mix bus.
3. In the Master Section, press the **CR Source** key to display the Mix Busses in the Panel Viewer and select the **B Source**.
4. Move channel 3's fader up and set **Pan** to center.
5. In the Master Section, press the **CR Output** key to display the output formats in the Panel Viewer and select **Stereo**.
6. Turn off the **Cut** button and use the **Main Monitor** knob in the Master Section to adjust the control room monitor level.

Chapter 4: eMix Application

The eMix application has tabs along the bottom of the window to select between the following subjects:

- **Directory**: file management
- **Patchnet**: digital patchbay
- **Busses**: formatting of group and mix busses
- **System**: system setup
- **Folddown**: folddown formats
- **Masters**: format master channels (see Chapter 9: *Control Groups and Multi Format Masters*) and externals
- **Conform**: interface to enter conform information for automation system (see *Automation Conform* on page 199)
- **Events**: GPI/O event configuration (see Chapter 12: *GPI/O Event System*)
- **Diagnostics**: Summary of system status

Each tab is discussed in the following sections.

4.1 Directory

The Directory tab contains its own tabs right above the main eMix tabs: **Drives**, **Projects**, **Titles**, and **Mixes**. The order of these tabs also represents their hierarchy (i.e., a Title is within a Project located on a Drive). Operations in the Directory are almost identical to those in Windows.

4.1.1 Projects

Browse Existing Project

1. Click the **Drives** tab to see a list of available Drives.
2. Single-click to select the desired Drive and click the **Projects** tab button or double-click the Drive.

   The Projects Window opens with a list of Projects on that Drive.
3. Select a Project and click the **Titles** tab or double-click the Project.

   The Titles Window opens with a list of Titles in that Project.

4. Select a Title and click the **Open** button or double-click the Title.

   Clicking **Open** opens the Title with the last mix used. Double-clicking the title opens the Mixes Window with a list of Mixes in that Project.

Open or Create a Project

1. Click the **Drives** tab to see a list of available Drives.
2. Select the desired Drive and click the **Projects** tab or double-click the Drive.

   The Projects Window appears with a list of Projects on that Drive.
3. To create a new Project, click the **New** button along the right side of the Projects window.

   Name the new Project in the dialog that appears.

   OR

   Double-click an existing Project or select an existing Project and click the **Titles** tab. The Titles Window appears.

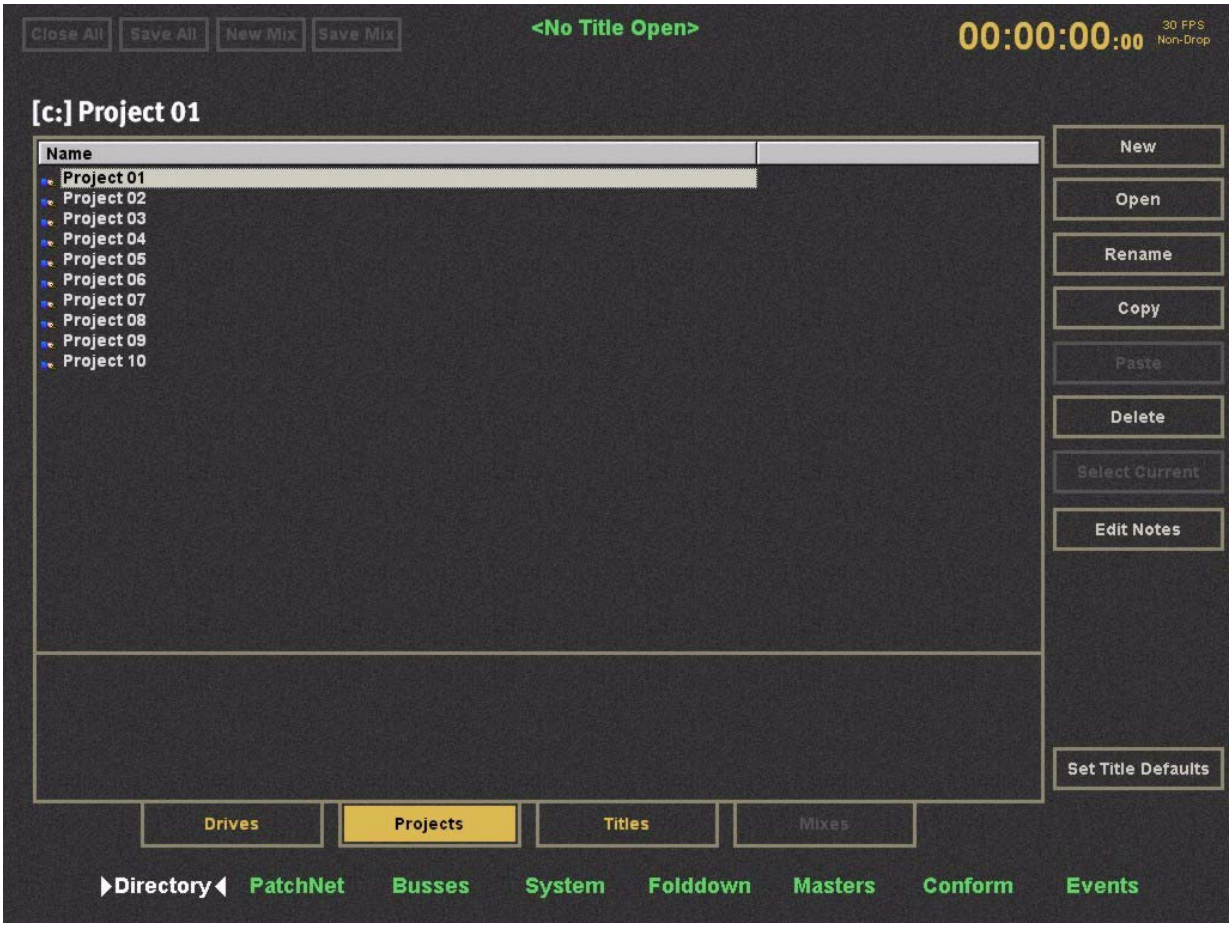


Figure 4-1 Projects Window

Rename, Copy, Paste, or Delete Project

These buttons are arranged vertically along the right side of the Projects Window. Copying a Project and pasting it to another Drive is the easiest way to backup a Project.

Select a Project from the Projects Window.

- Click the **Copy** button to copy the selected Project.

  The **Paste** button remains dim until the **Copy** button is used.

- Click the **Paste** button to paste the copied Project. Of course, you can navigate the Directory to another Drive before pasting.

  If the selected Project's name is *Test*, the copied Project is *Copy of Test*.

- Click the **Rename** button to rename the selected Project in the dialog that appears.

- Click the **Delete** button to delete the selected Project.

  The Project is deleted and *does not get copied to the **Copy** buffer*.

4.1.2 Titles

A Project must exist before selecting, opening, or creating a new Title. The **Rename**, **Copy**, **Paste**, and **Delete** buttons work the same on Titles as described above for Projects.

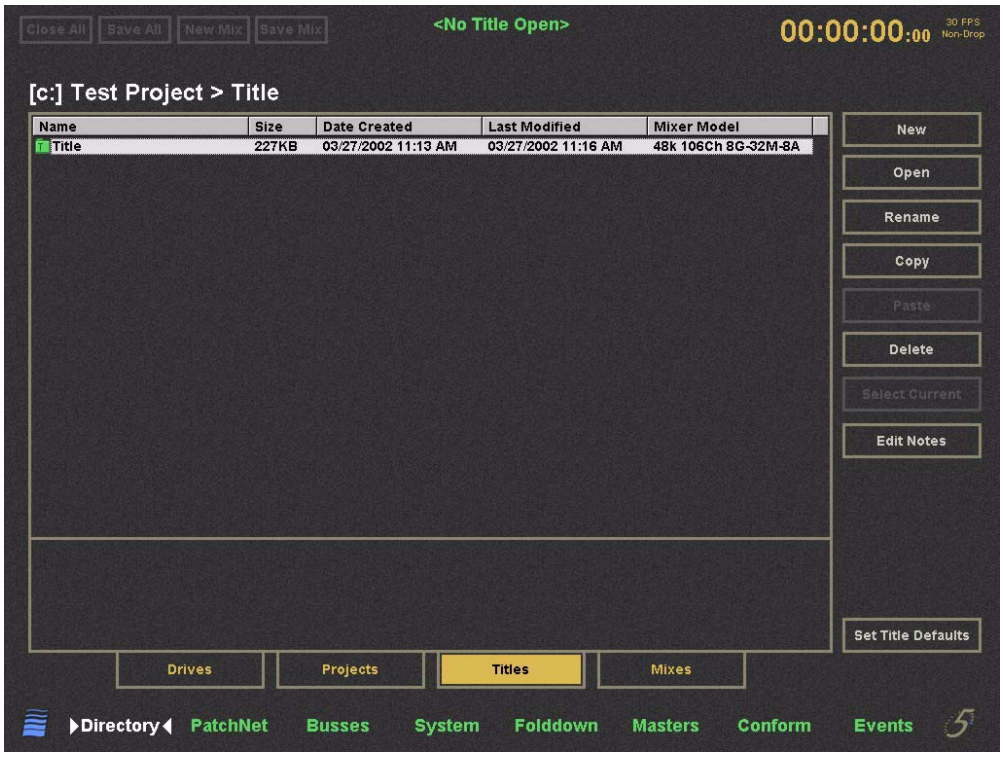


Figure 4-2 Titles Window

Create New Title

1. Click the **Drives** tab to see a list of available Drives.
2. Select the desired Drive and click the **Projects** tab or double-click the Drive.

   The Projects Window appears with a list of Projects on that Drive.
3. Select a Project and click the **Titles** tab or double-click the Project.

   The Titles Window appears with all Titles in that Project.
4. Click the **New** button along the right side of the Titles window.

   The **New Title** dialog appears.

New Title
Please enter a name for the new title:
Title
OK
Cancel
Creation Options:
Save the current title and mix data into the new title
Reset Console with Default Title settings
(Note: Any unsaved changes to the current title & mix will be lost)

Figure 4-3 New Title dialog

5. Name the new Title and select one of the **Creation Options** radio buttons:

- **Save the current title and mix data into the new title**: Uses the current state of the console for new Title. If a mix is open, that mix is saved in the new title.
- **Reset Console with Default Title settings**: Uses settings for Default Title to reset console. See page 42 to see how to change the default settings. There is no mix in the new title; one must be explicitly created.

NOTE: *A Title appears as a folder but is actually a single file with multiple Mixes.*

Open Existing Title

1. Click the **Drives** tab to see a list of available Drives.
2. Select the desired Drive and click the **Projects** tab or double-click the Drive.

   The Projects Window appears with a list of Projects on that Drive.
3. Select a Project and click the **Titles** tab or double-click the Project.

   The Titles Window appears with all Titles in that Project.
4. To open a Mix *other* than the last one used, double-click the Title or click the **Mixes** tab. The Mixes Window displays existing Mixes. See page 40 to see how to open a Mix.

   To open the Title with the last Mix used, just select the Title and click **Open**.

4.1.3 Mixes

A Project and Title must exist before selecting, opening, or creating a new Mix. The **Rename**, **Copy**, **Paste**, and **Delete** buttons work the same on Mixes as described on page 37 for Projects.

Create New Mix

1. Click the **Drives** tab to see a list of available Drives.
2. Select the desired Drive and then click the **Projects** tab to see a list of Projects on that Drive.
3. Select a Project and click the **Titles** tab to see the Titles within that Project.
4. Select the desired Title and click the **Open** button along the right side of the Titles window.
5. Click the **New Mix** button at the top of the eMix window.
6. Name the Mix in the **New Mixes** dialog.

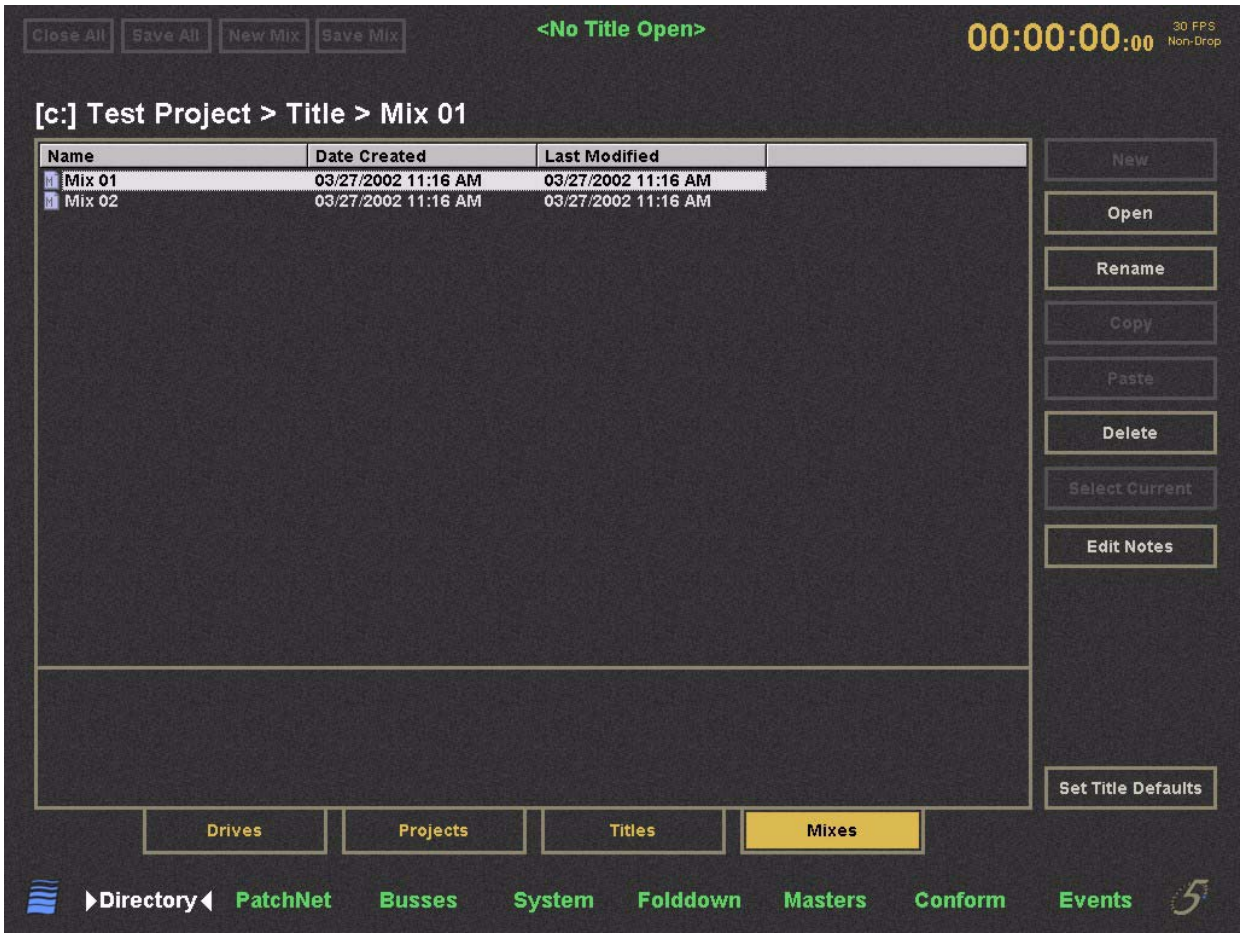


Figure 4-4 Mixes Window

Open Existing Mix

1. Click the **Drives** tab to see a list of available Drives.
2. Select the desired Drive and click the **Projects** tab or double-click the Drive.

   The Projects Window appears with a list of Projects on that Drive.
3. Select a Project and click the **Titles** tab or double-click the Project.

   The Titles Window appears with all Titles in that Project.
4. To open the Title with the last Mix used, select the Title and click the **Open** button on the right side of the Titles Window.
5. To open a Mix *other* than the last used, double-click the Title or click the **Mixes** tab.

   The Mixes Window appears with existing Mixes.
6. Select the desired Mix and click the **Open** button.

NOTE: *You cannot open a Mix by double-clicking it.*

Change Mix Within Same Title

1. Navigate to the Mixes window.
2. Click **Save Mix** or **Save All** (see Section 4.1.4 for explanation of difference) at the top of the window.
3. Click **New Mix** at the top of the window or select the desired existing Mix and click the **Open** button.

4.1.4 Operations on Current Title and Mix

Figure 4-5 File operations buttons for current Title

The four buttons at the top of each Directory Window provide an easy way to operate on the currently open Title and/or Mix from any window. They are dim if a Title is not open.

Close All and **Save All** close and save, respectively, *both* the Title and Mix.

Save Mix saves *only* the automation data *without* saving the Title's other data (same as the automation panel's **Save Mix** key).

New Mix creates a new Mix and prompts to save the current open mix.

Select Current

Click the **Select Current** button to instantly navigate back to the currently open Mix in the Mixes Window. This is a convenient way to browse the Directory without losing your place.

Edit Notes

Click the **Edit Notes** button to enter information about the Title or Mix.

4.1.5 Title Defaults

This section describes how to set up basic PatchNet settings when a new Mixer Model is selected. This process includes naming the device inputs and outputs and connecting group bus outputs to multitrack inputs. The setup process is equivalent to setting and labeling the normalled connections on a conventional patch.

NOTE: *To clarify the use of the terms* **Inputs** *and* **Outputs** *in PatchNet,* **Device** *pertains to equipment other than the System 5 console. Therefore,* **Device Inputs** *refers to inputs to an external device, not the console.*

These settings are stored to the Title Defaults and are automatically included with each new Title. Each Mixer Model has a Title Defaults file. A new Title inherits these basic settings from the Title Defaults:

- PatchNet settings and names
- Bus Setup: names and formats
- Externals Setup: names and formats
- SnapShots
- Layouts
- Meter setups

NOTE: *While the Title Defaults is a file on the System Computer for each Mixer Model, it does not appear in the Directory.*

Setting the Title Defaults

The Title Defaults can be set by clicking the **Set Title Defaults** button on the Titles page in PatchNet. This copies all settings listed above from the currently open Title into the Title Defaults for the current Mixer Model. The warning in Figure 4-6 appears to confirm this action.

Warning - Updating Title Defaults
The current title settings (PatchNet, Bussing, Layouts, Externals, etc.) will be made the default settings for ALL NEW TITLES on this system.
OK
Cancel

Figure 4-6 Updating Title Defaults warning

Normalled Connections

The inputs and outputs that require normalled connections should be designated in PatchNet and saved to the Title Defaults.

In this example, the console group bus outputs 1–24 should be patched to both the R-1 and DAW inputs. Figure 4-7 shows the R-1 inputs patched from the Group Bus outputs.

If a Source is normalled to multiple destinations, **<MULT>** appears in the cell next to the source.

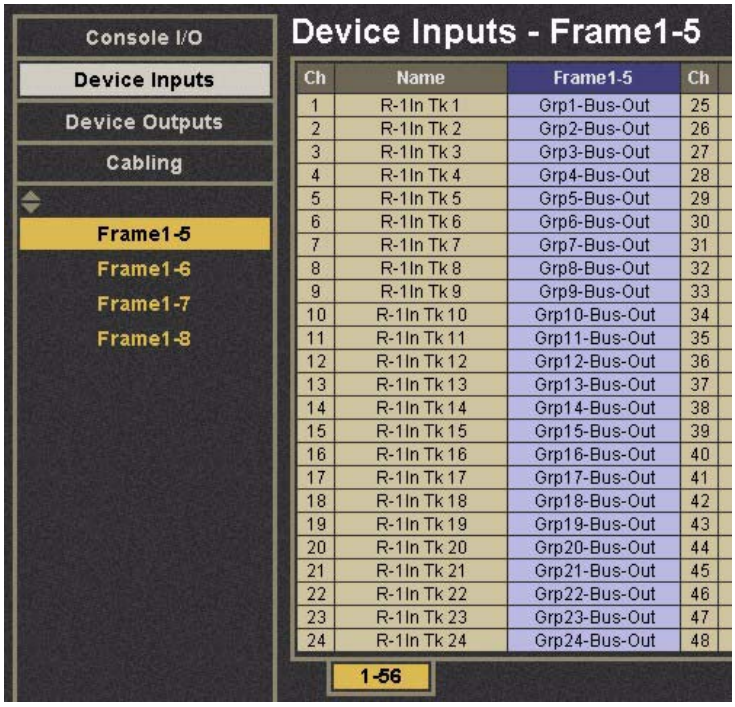

Console I/O
Device Inputs
Device Outputs
Cabling
Frame1-5
Frame1-6
Frame1-7
Frame1-8
Device Inputs - Frame1-5
Ch
Name
Frame1-5
Ch
1 R-1In Tk 1 Grp1-Bus-Out 25
2 R-1In Tk 2 Grp2-Bus-Out 26
3 R-1In Tk 3 Grp3-Bus-Out 27
4 R-1In Tk 4 Grp4-Bus-Out 28
5 R-1In Tk 5 Grp5-Bus-Out 29
6 R-1In Tk 6 Grp6-Bus-Out 30
7 R-1In Tk 7 Grp7-Bus-Out 31
8 R-1In Tk 8 Grp8-Bus-Out 32
9 R-1In Tk 9 Grp9-Bus-Out 33
10 R-1In Tk 10 Grp10-Bus-Out 34
11 R-1In Tk 11 Grp11-Bus-Out 35
12 R-1In Tk 12 Grp12-Bus-Out 36
13 R-1In Tk 13 Grp13-Bus-Out 37
14 R-1In Tk 14 Grp14-Bus-Out 38
15 R-1In Tk 15 Grp15-Bus-Out 39
16 R-1In Tk 16 Grp16-Bus-Out 40
17 R-1In Tk 17 Grp17-Bus-Out 41
18 R-1In Tk 18 Grp18-Bus-Out 42
19 R-1In Tk 19 Grp19-Bus-Out 43
20 R-1In Tk 20 Grp20-Bus-Out 44
21 R-1In Tk 21 Grp21-Bus-Out 45
22 R-1In Tk 22 Grp22-Bus-Out 46
23 R-1In Tk 23 Grp23-Bus-Out 47
24 R-1In Tk 24 Grp24-Bus-Out 48
1-56

Figure 4-7 Device Inputs normalled

Layouts

Typical useful layouts are

- Strips 1–24

  Main: Channels 1–24; Swap Channels 25–48
- Strips 25–48

  Main: Channels 1–48; Swap Channels 49–96

Meter Presets

The following are useful meter presets:

- All meters single; follow fader
- All meters single; Group Bus Outputs
- All meters single; Mix Bus Outputs
- All meters single; Aux Sends
- 1–24 Dual: Fader + Group Bus 1–24

4.2 PatchNet

PatchNet is a digital patching system that uses a MADI routing hub to connect sources to destinations.

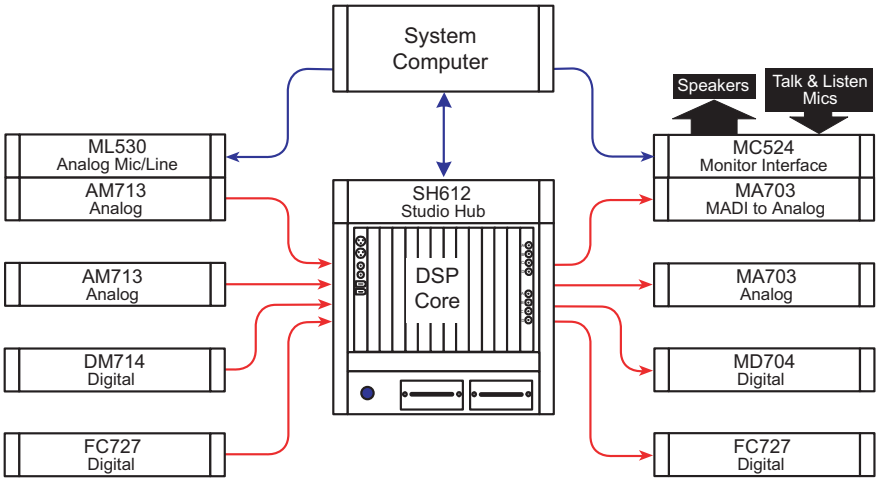


Figure 4-8 Simplified MADI routing diagram

The following Euphonix devices provide a robust and complete I/O interface:

- The DM714 (AES/EBU-to-MADI) and MD704 (MADI-to-AES/EBU) converters provide 26 channel inputs and outputs.
- The AM713 (analog-to-MADI) and MA703 (MADI-to-analog) converters provide 24 fixed-gain channel inputs and outputs.
- The ML530 provides 24 remote, variable gain, analog, mic/line preamps that can be controlled from the Strip.
- The FC727 and FC726 provide 56 channels of digital format conversion.

Some equipment, such as the Euphonix R-1, the Sony 3348HR recorder, and some high end consoles, offer a MADI interface. Most equipment, however, (i.e., mics, speakers, DAWs that support AES/EBU and vintage gear) must convert to and from MADI using the appropriate Euphonix converter.

PatchNet allows connections between the console and external devices in exactly the same way as a conventional analog patchbay. The crucial difference is that once a patch is made it can be saved and recalled with the Title.

NOTE: *To clarify the use of the terms* **Inputs** *and* **Outputs** *in PatchNet,* **Device** *pertains to equipment other than the System 5 console. Therefore,* **Device Inputs** *refers to inputs to an external device, not the console.*

When entering an analog studio, the patchbay is wired to all the equipment supplied with the room. The multitrack is normalled to the console line inputs, the mics to the console mic inputs, and the outboard gear is ready to be patched into channels.

System 5 must be initially set up so all studio equipment comes up on the PatchNet screen and is correctly labelled and normalled ready for a session. This basic wiring information is stored in the Title Default so these settings can be used when starting a new session with a new Title. To set up System 5 studio wiring and set the Title Default, see *Title Defaults* on page 42.

Enter PatchNet by clicking the **PatchNet** tab at the bottom of the eMix screen. PatchNet has four categories: Console I/O, Device Inputs, Device Outputs, and Cabling.

4.2.1 Console I/O

Click **Console I/O** on the upper-left of the PatchNet window, then click **A and B Inputs** from the sub-categories below it (Figure 4-9). Click in the **Name** field and type a name for a channel. This is where connections to the channel's A and B inputs are made.

Figure 4-9 Console I/O A and B inputs Window

Figure 4-10 shows the lower part of the Console I/O window. The **Selected:** area shows the sources and destinations for the **A Input** and **B Input** cells selected above. The numbered tabs (1–48 etc.) display additional pages of patchpoints. The four buttons on the right of Figure 4-10 perform the following functions:

- **Patch**: Patches selected patchpoints
- **Unpatch**: Unpatches selected patchpoints
- **Clear**: Deselects selected patchpoints
- **View Log**: Shows a log of failed patches

Figure 4-10 Bottom of Console I/O window

4.2.2 Device Inputs and Outputs

There are up to 12 MADI device input/output ports on the console, each carrying up to 56 channels (44.1/48 kHz) or 28 channels (96 kHz).

NOTE: *To clarify the use of the terms* **Inputs** *and* **Outputs** *in PatchNet,* **Device** *pertains to equipment other than the System 5 console. Therefore,* **Device Inputs** *refers to inputs to an external device, not the console.*

4.2.3 Cabling

This category handles MADI cable connections for the ML530s.

Mic/Line Interface Patching

For mic inputs and analog inputs not at +4 dB, the Euphonix ML530 provides 24 preamps each with gain, phantom power, high-pass filter, and hiZ/loZ switching. The analog outputs are connected to an AM713 Analog to MADI converter which then connects to one of the MADI inputs.

For each ML530, PatchNet needs to know which MADI input the AM713 is connected to so the mic preamp parameters appear on the corresponding input channel knobset. For each Mic/Line Interface, note how it is connected. In the example that follows, the MADI output from the Analog to MADI converters of two ML530 Mic/Line interfaces have been connected to the inputs of Hub1-1 and Hub1-2.

1. Select **Cabling** in PatchNet.
2. Select the **MADI Out Ports** sub-category.

   The list shows 7 Mic/Line Interfaces but only configure those wired to the Hub (i.e., Mic1 and Mic2).
3. Click and drag through the cells to the right of Mic1 and Mic2.

   The cells highlight green and the names appear in the **Sources** column of the **Selected:** window below.
4. Select the **MADI In Ports** sub-category.
5. Click and drag through the cells to the right of the two Hub1 inputs (Hub1-1 and Hub1-2).

   The cells highlight green and the names appear in the **Destinations** column of the **Selected:** window below.
6. Click the **Patch** button to make the patch.

PatchNet now knows how the two mic/line interfaces are connected so the proper input parameters appear at the top of the channels they are connected to.

Because Hub1-1 and Hub1-2 have been designated as MADI connections to the Mic/Line interfaces, clicking on the Hub1-1 and Hub1-2 sub-categories in **Device Outputs** show **Device Patch** in the first 24 cells and will not allow selection unless they are unpatched.

4.2.4 Patching Examples

Patch 12 mics into channels 25–36

Select the Sources

1. Click on **Device Outputs** from the four PatchNet categories.
2. Click on Mic-Line 1 from the sub-categories.

   This displays all inputs in the center of the window from the first Mic-Line Interface. In The Mic-Line Interface is connected as part of the initial studio setup.

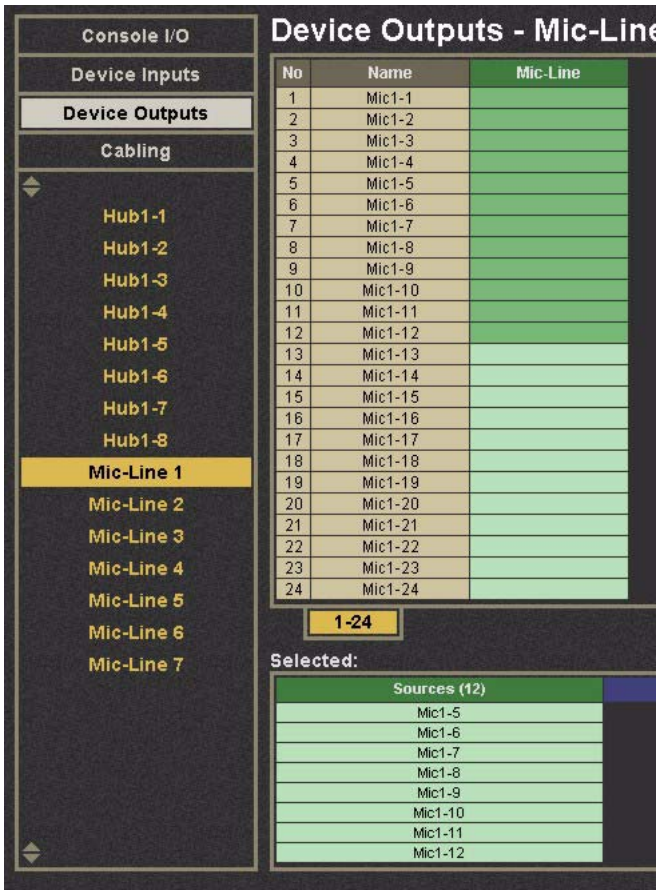


Figure 4-11 Device Outputs window

3. Select Mic1-1–Mic1-12 from the **Mic-Line** column by clicking and dragging through the cells.

   These entries are highlighted in green in Figure 4-11. These sources appear in the **Sources** column of the **Selected:** window below. If there were more than 24 sources, additional tabs would appear to the right of the **1–24** tab.

Select the Destinations

There can be:

- one source to one destination;
- an equal number of sources to destinations;
- one source to multiple destinations.

Multiple sources cannot be routed to one destination.

To set the destinations for the 12 mics:

4. Select the **Console I/O** category and the **A and B Inputs** sub-category.
5. Click and drag through the **A Input** column next to C25–C36 to select channels 25–36.

   The entries are highlighted in green and the list of A input channels appear in the **Destinations** column in the **Selected:** window below (Figure 4-12).

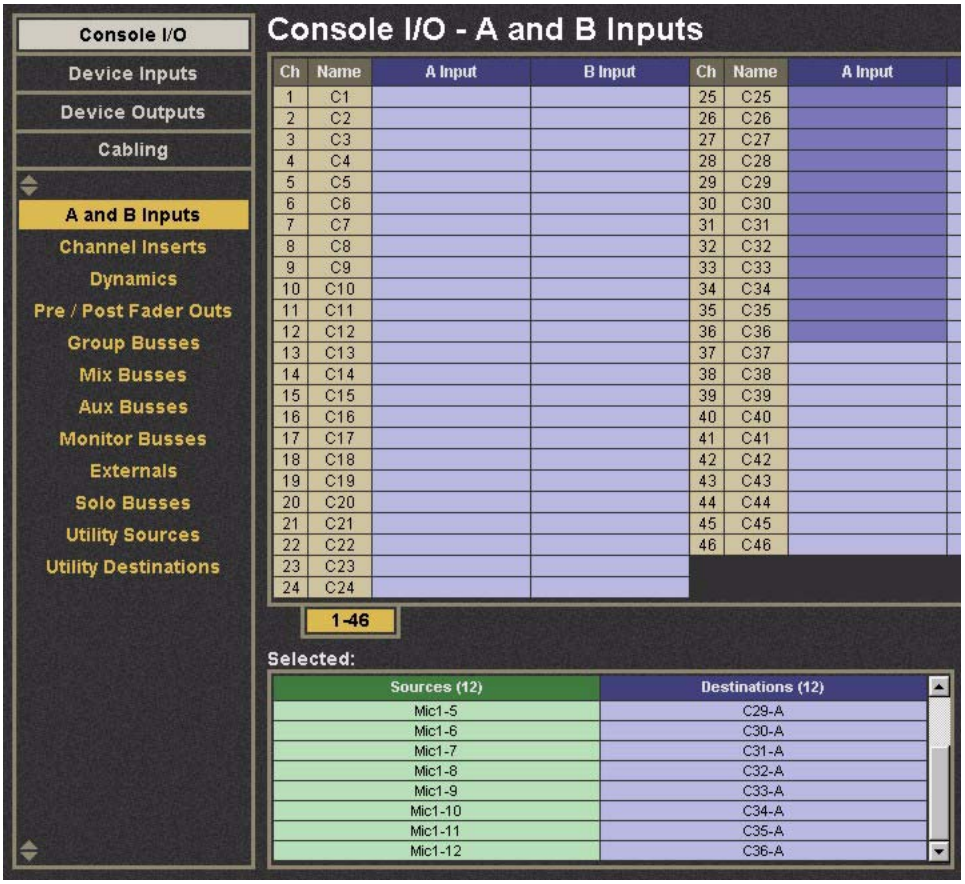


Figure 4-12 Selecting destination channels

6. Click the **Patch** button to make the connection.

   The sources and destinations appear in the **A Input** and **Name** columns, respectively (Figure 4-13). The sources and destinations are cleared from the **Selected**: area.

Ch	Name	A Input
25	C25	Mic1-1
26	C26	Mic1-2
27	C27	Mic1-3
28	C28	Mic1-4
29	C29	Mic1-5
30	C30	Mic1-6
31	C31	Mic1-7
32	C32	Mic1-8
33	C33	Mic1-9
34	C34	Mic1-10
35	C35	Mic1-11
36	C36	Mic1-12

Figure 4-13 Mics Patched to Channels

Patch the multitrack returns into channels 1–24

1. Click on the **Device Outputs** category.
2. Click on the **Hub1-3** sub-category.
3. Click and drag through the first 24 cells in the Hub1-3 column.

   These cells are highlighted and their names appear in the **Sources** column in the **Selected:** window below.
4. Select the **Console I/O** category.
5. Select the **A and B Inputs** sub-category.
6. Click and drag through the first 24 cells in the **A Input** column.

   These cells are highlighted and their names appear in the **Destinations** column in the **Selected:** window below.
7. Click the **Patch** button to make the connection.

   The sources and destinations appear in the **A Input** and **Name** columns, respectively. The sources and destinations are cleared from the **Selected:** area.

   After connecting the 12 mics and the R-1 returns, the Console I/O A and B Inputs Window is shown in Figure 4-14.

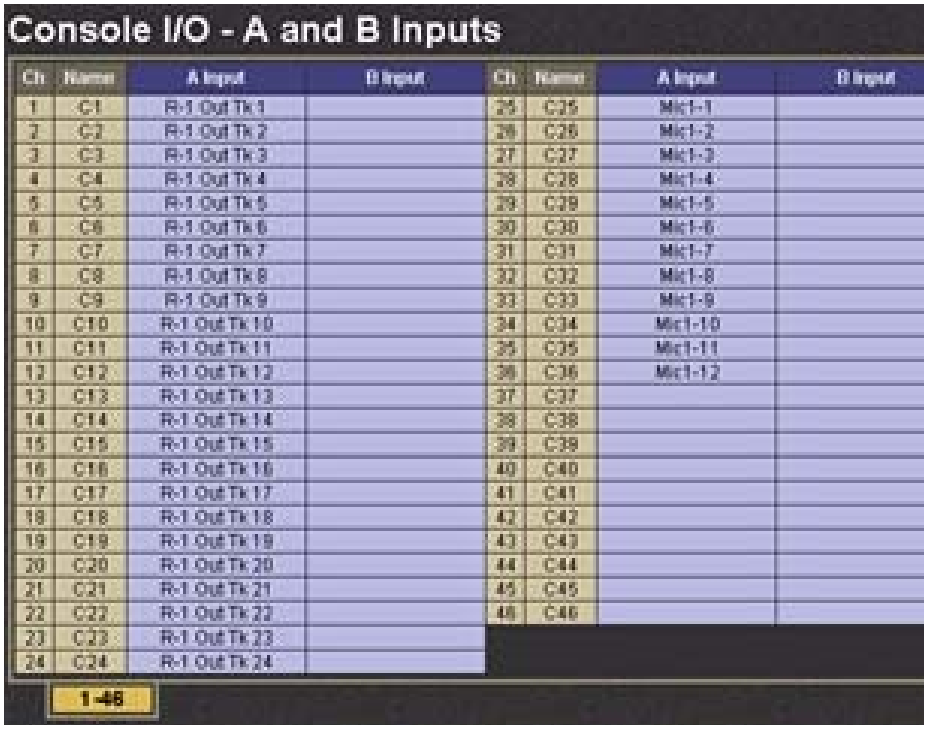


Figure 4-14 R-1 and mics patched

4.2.5 Mix Bus Send/Return

Click the **Console I/O** category and then click the **Mix Busses** sub-category. Each mix bus has a send and return. In Figure 4-15, the first six sends (a 5.1-channel mix section) are routed to channels 41–46 A inputs. The insert is switched in/out from the Bus Masters Config Page (see *Bus Master Inserts* on page 94).

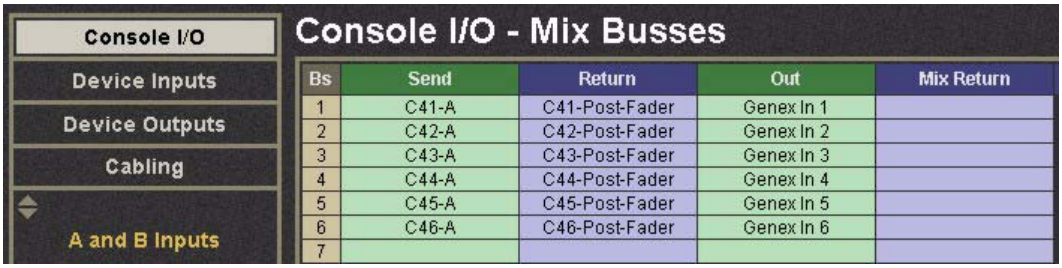


Figure 4-15 Mix Bus Send and Return

For every Mix Section, there is a corresponding return in the same format, which allows patching the Mix Section recorder output back into the console. The Mix Section Return can be routed to the monitors from the Mix Section page in the CR Source Panel (see *Control Room Monitor Controls* on page 66).

4.2.6 Monitor Patching

The monitor outputs are automatically routed to the analog patch unit supplied with System 5 and are ready to be normalled to the speaker inputs. The monitor feeds are also available within PatchNet for routing to other destinations, if necessary.

Click on the **Console I/O** category and the **Monitor Busses** sub-category. This window shows all 22 monitor feeds:

Monitor	Busses	Format
1–8	Control Room	L, C, R, Sl, Sr, Bm, X, Y
9–16	Mon A	L, C, R, Sl, Sr, Bm, X, Y
17–18	Mon B	L, R
19–20	Mon C	L, R
21–22	Mon D	L, R

The Cascade inputs allow for direct bus injection prior to the insert point into all monitor signal paths.

4.2.7 Solo Bus and Utility Patching

The **Solo Busses** sub-category in **Console I/O** allows custom patching into the stereo Solo Bus.

The **Utility Sources** sub-category includes the Oscillator output. The **Utility Destinations** sub-category includes the Slate In which must be patched to the Talkback mic feed from the Monitor Interface.

4.2.8 Talkback Signal Patching

The talkback mics are wired to the MC524 Monitor Controller. They are amplified to produce a single talkback signal. This analog signal must be fed into the system through an Analog to MADI converter. See Figure 1-1 on page 22.

To send talkback to the busses, this signal must be patched to the Slate Input (in the **Utility Destinations** subcategory of the **Console I/O** category). Note which analog-to-MADI converter input the talkback signal has been patched to and connect that channel to the Slate Input.

4.3 Busses

Click the **Busses** tab at the bottom of the eMix window to display the Busses window. At the bottom left of the window, click either the **Group** or **Mix** buttons to configure the Group or Mix busses, respectively (Figure 4-16 shows the Mix busses; Figure 4-17 shows Group busses). Group and Mix busses differ in two ways:

- There are 16 Mix sections but only one set of Group busses.
- Mix sections have associated recorder playback returns.

Figure 4-16 Mix Bus Window with law palette

Figure 4-17 Group Bus Window

The letters at the far left of Figure 4-16 denote the 16 mix sections. The letters “I” and “L” have been omitted to avoid being confused with one another. Click the cell to the right of the letter to name the section. The number of busses available is indicated by the blue area in Figure 4-16 (i.e., there are 32 busses). The gray area represents busses that are not available due to the present system configuration.

4.3.1 Law Palette

To set the pan law for a mix section:

1. Click and drag across the busses you wish to configure.
2. Right-click on any of the selected cells to display the Law Palette.

Figure 4-18 Law Palette

The possible formats are:

Symbol	Format
-	remove an existing law from a bus
mono	M
stereo	St L, St R
Dolby Surround	Db L, Db C, Db R, Db S
5.1	L, C, R, SL, SR, B
6.1	L, C, R, SL, SR, SC, B
7.1	L, C, R, LC, RC, SL, SR, SC, B

Table 4-1 Law Palette Formats

3. Select the desired pan law by dragging across the Law Palette and releasing the mouse when the cursor is within that Law.

   Individual cells can also be assigned by right-clicking and selecting one entry at a time from a pan format. Right-click on a format entry to cycle through the channels to reassign the order.

4.4 Externals

Click the **Masters** tab at the bottom of the eMix window, At the bottom left of the window, click the **Externals** button to configure the Externals. Externals are configured in the same way as Mix and Group busses.

4.5 System

System 5 can be customized for each studio and application. The number of channels, busses, and external inputs available in any System 5 depends on the amount of processing in the DF64 Digital Core.

For a given number of processing cards, several different *Mixer Models* can be configured, each with different numbers of channels, mix and group busses, and aux sends. Mixer Models are supplied on CD-ROM and selected from within eMix. A system can be quickly and easily switched from stereo to surround sound, multiple-stem mixing by selecting from the available Mixer Models installed on the system.

The number of the DF64 Digital Cores determines the amount of processing available to the system: one, two, three, and four core systems are available. The system can be expanded at any time.

4.5.1 Mixer Model

Choosing a Mixer Model

The Mixers Models that support 96 kHz are intended for music applications requiring the highest digital sound quality where sources are analog or 24-bit 96 kHz (i.e., R-1 multitrack recorder). For lower resolution sources, such as 16-bit 44.1 or 48 kHz from digital recorders like the Sony 3348, the 44.1/48 kHz sample rate Mixer Models are more suitable. For post-production and on-air broadcast, 48 kHz is a perfectly acceptable sample rate that will provide adequate audio quality with twice as many channels as 96 kHz.

When choosing a Mixer Model, give careful consideration to the combinations of channels, mix and group busses, aux sends required. For many applications (other than multiple stem post mixing), the maximum number of mix busses used is six for a 5.1 Surround Mix Section. Take extra care in selecting the number of Aux sends you need in your system: they always seem to be used up!

Changing the Mixer Model

Figure 4-19 Mixer Models

1. Click the **System** tab at the bottom of the eMix Window.
2. From the list on the left of the System window, select the desired Mixer Model.

   The name of the Mixer Model describes the sample rate, number of channels, and bus architecture. The central part of the window displays the hardware configuration required to run the Mixer Model selected.
3. If your system has the required hardware and this is the proper configuration, click **Activate Mixer Model**.
4. eMix will prompt you to restart the system. Click **OK** to restart eMix.

If the new mixer model has a different sample rate, see below. If not, power off the control surface, pilots, and digital frames and reboot.

Changing Sample Rate

To change the sample rate, you must first activate a Mixer Model with the desired sample rate as described in the previous section.

1. Change the sample rate of the studio master digital sync generator.

   This must be done before changing the Sync Source on the DF64 digital cores. This makes it easier to tell when the controller cards are set to the correct Sync Source option.

2. Locate the controller card in each DF64. Each card has a section labeled **Sync Source** with a recessed button allowing cycling through the sync options; a paper clip can be used to press the button.

3. Select the required sync source and sample rate. The *1x* modes are used for 44.1 and 48 kHz, and the *2x* modes are for 96 kHz.

   The order is:

   AES 1x

   Word 1x

   Internal 44.1

   Internal 48

   AES 2x

   Word 2x

   Internal 96

4. Power off the console, pilots, and digital cores and reboot.

4.6 Folddown

Click the **Folddown** tab at the bottom of any eMix window to display the Folddown window (Figure 4-20). This window allows you to set rules by which one monitor output format (Format In along the left) is played by a different format (Format Out on top). For example, to play a 5.1-channel mix in LCRS, you could map the Boom channel to all channels attenuated by 6 dB and the Sl and Sr to the S channel without attenuation.

To maintain all audio information present in the original format, each **Format In** channel is usually mapped to some channel(s) in the **Format Out**. However, this is not mandatory: One might choose to omit the Boom channel because the speakers in the output format cannot handle bass below a certain frequency.

Click in any cell and type in the amount of attenuation (-17 to 0 dB) that the Format Out channel will undergo as it is routed to the Format In channel. Click and drag across multiple cells to enter an amount for all selected cells. Right-click on selected cells to display a menu with two options:

- **Clear**: Clears values so no signal is routed.
- **Default**: Sets cells to their factory default values. This occurs even in a stored preset.

There are 24 presets available to store and recall different Folddown settings. The **Recall Preset** and **Store Preset** buttons are on the top-right of the window.

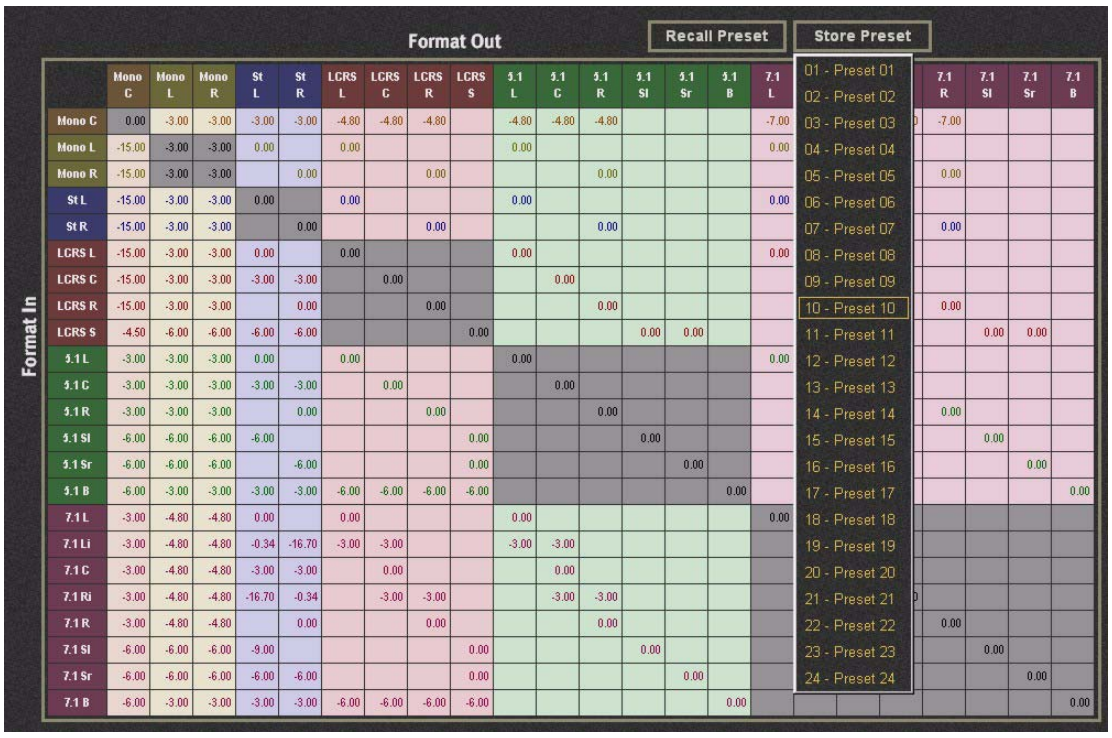


Figure 4-20 Folddown window

4.7 Diagnostics

When a system error occurs and the user is not in the Diagnostics page, the Euphonix logo and top-screen border flashes, alerting the user to inspect the Diagnostics page. Display the Diagnostics page by clicking the Euphonix logo at the bottom-left corner of the main Emix screen.

Press the reset button on the module, DSP card, or PC that shows the error. A dialog box appears requesting that you resynchronize the system. Click **Yes** and the system should function normally again.

Ctrl+Alt+F12 disables the diagnostics system warning.

Close All
Save All
New Mix
Save Mix
<No Title Open>
00:00:00:00
30 FPS Non-Drop
Module Id Boot Status
401 1-15 100% Ready
402 1-16 100% Ready
408 1-1 100% Ready
408 1-2 100% Ready
408 1-3 100% Ready
Pilot 1 100% Ready
Pilot IF1 100% Ready
Pilot : 1 192.168.0.200
System Information
Software Status OK
SBC Memory 128MB
Primary Controller Active
Hardware OK
Software OK
Chassis ID 1
Battery OK
Sync Type external AES 2x
PLL status Locked
Sync Freq 96.00 kHz
Card Details
Slot H/W Type S/W Role DSP Health
Backup Controller Unknown No
1 OK DSP OK 1 A B C D E F Busses Card
2 OK DSP OK 2 A B C D E F Busses Card
3 OK DSP OK 3 A B C D E F Busses Card
4 OK DSP OK 4 A B C D E F Busses Card
5 OK DSP OK 5 A B C D E F Channel Card
6 OK DSP OK 6 A B C D E F Channel Card
7 OK DSP OK 7 A B C D E F Channel Card
8 OK DSP OK 8 A B C D E F Channel Card
9 OK DSP OK 9 A B C D E F Channel Card
10 OK No
11 OK MADI OK 11 Madi I/P: A B C D
12 OK MADI OK 12 Madi I/P: A B C D
Resynchronise
View Log
Directory
PatchNet
Busses
System
Folddown
Masters
Conform
Events

Figure 4-21 Diagnostics Window

4.8 Masters

See Chapter 7: *Busses and Bus Masters*.

4.9 Conform

See *Automation Conform* on page 199.

4.10 Events

See Chapter 12: *GPI/O Event System*.

4.11 System 5 Logo

Clicking on the System 5 Logo in the lower right corner of the eMix screen will display software version information and shutdown options.

Chapter 5: CM401 Master Section

The CM401 Master Module (Figure 5-1) controls master functions for Monitors, Communications, Solo, and Meters. This chapter discusses each subject is in detail.

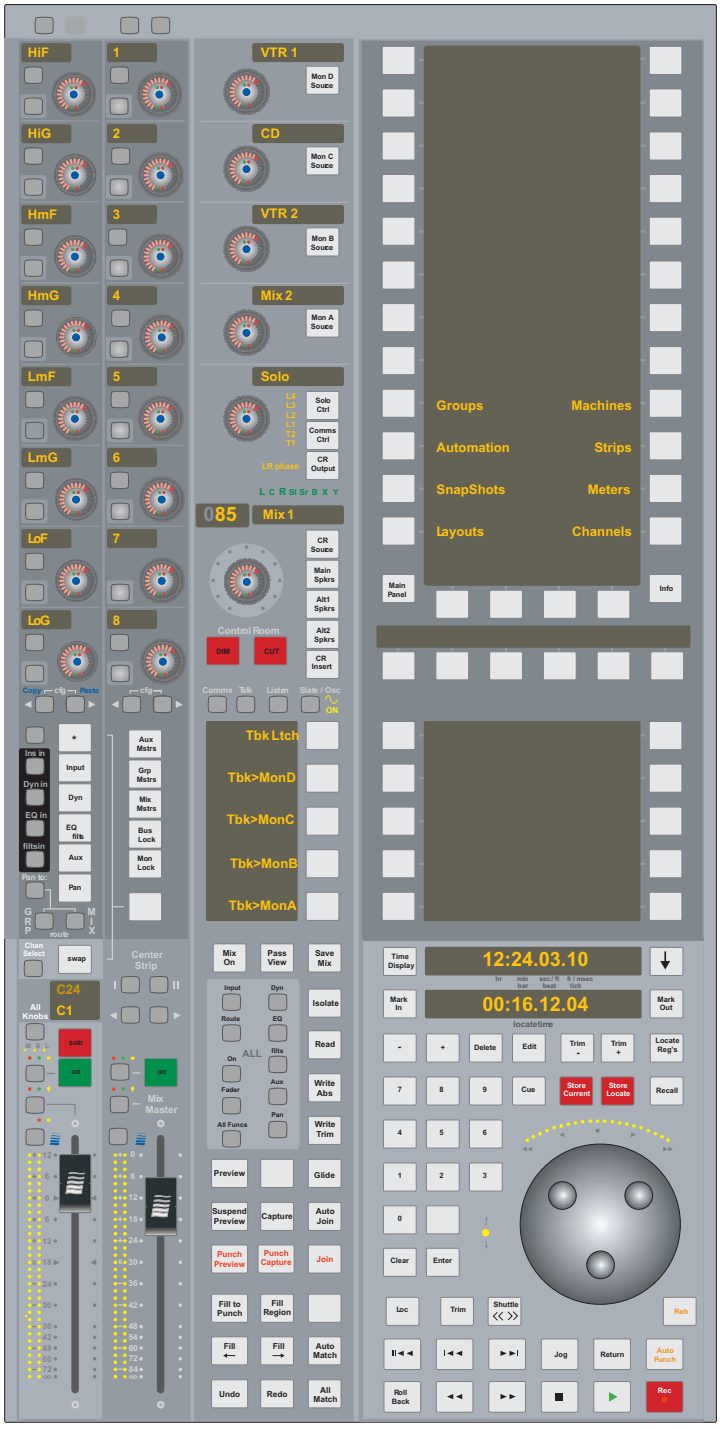


Figure 5-1 CM401 Master Module

5.1 Monitoring

The System 5 monitor system accommodates multiformat outputs up to 7.1 channels. There are seven monitor outputs (Figure 5-2):

- The Main Control Room and Mon A (7.1 max)
- Alt 1 (5.1 max)
- Alt 2, Mon B, C, and D route two busses (stereo)

Mon A, B, C, and D are used for SLS/Cue feeds.

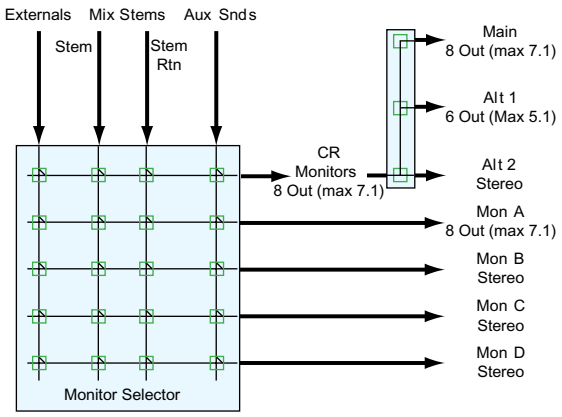


Figure 5-2 Monitoring Matrix

Source selection for the monitor output can either intercancel (only one source to a monitor output), or sum (multiple sources). The Control Room monitor outputs can be *folded down* from their multichannel formats (see *Folddown* on page 59).

NOTE: *Group bus outputs are normally monitored on the Strips but can be routed using external inputs and PatchNet if they require direct monitoring.*

5.1.1 Monitor Source Selection

The sources for Mon A–D and Control Room outputs are selected using the Panel Viewer. Press the **Mon A–D** or **CR Source** buttons to display available sources (Figure 5-3 shows the Mon D Source Panel).

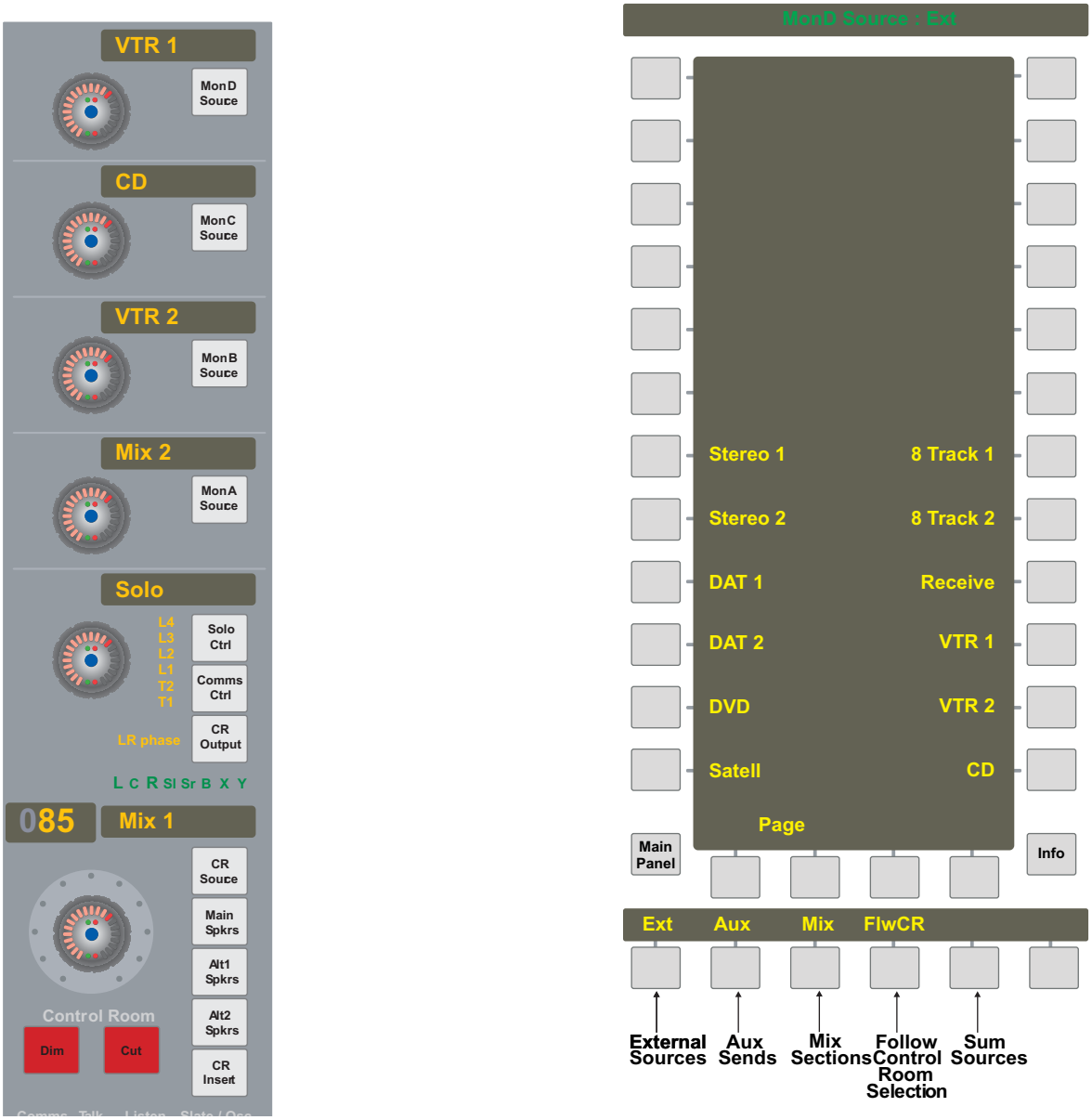


Figure 5-3 Monitor Controls and MonD Source Panel

Use the keys on the bottom of the Panel to select the type of source: External (CD, VTR, etc.), Aux Sends, or Mix Sections. The current source type key lights and available sources within that type appear in the Panel. Press a key along the sides of the Panel to select a source. The active source key lights and the name appears in the LCD display for that monitor output.

Sum or Intercancel

The Σ key is inactive (not lit) by default, which means that selecting a new source automatically cancels the previous one. When the Σ key is lit, multiple sources can be selected simultaneously. The Σ symbol appears to the left of the first source selected in the LCD display in the monitor controls. After selecting multiple sources, pressing the Σ key again (so it is not lit) *does not deselect theses sources until a new source is explicitly selected*.

Follow Control Room Monitors

Activate the **FlwCR** key so the Mon A–D outputs follow the source selected for the Control Room monitors.

5.1.2 Mix Section and Aux Send Format

Each Mix section also has a return that allows Bus/Tape monitoring. The returns can be patched from the record machine's outputs using PatchNet (see *Mix Bus Send/Return* on page 52). It is not possible to select a Mix section and its return at the same time; they intercancel even in Summing mode.

Aux Sends appear in the Panel as mono or stereo pairs.

5.1.3 Control Room Monitor Controls

Press the **CR Output** key above the CR Source LCD to display the Control Room Output Panel (Figure 5-4).

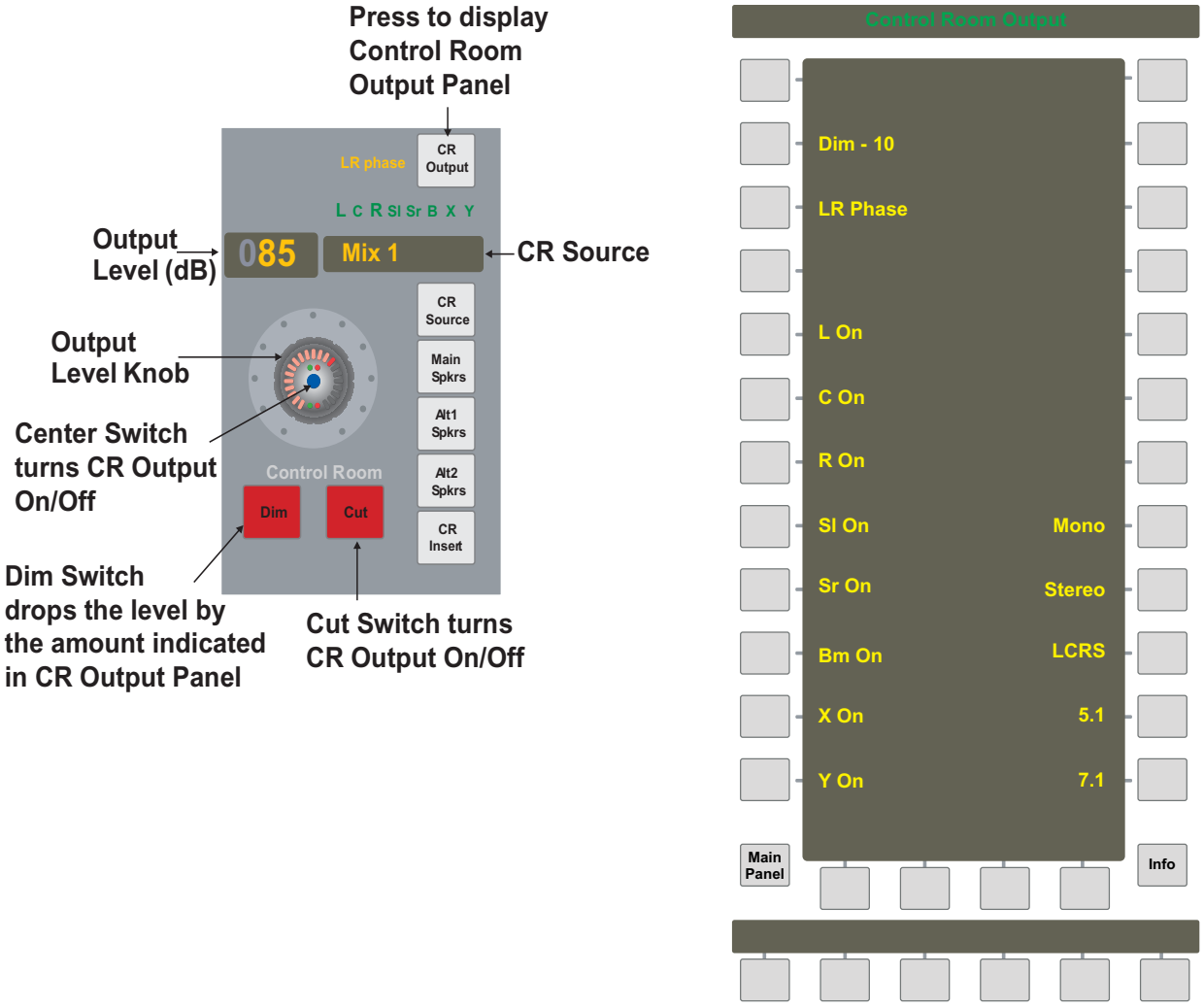


Figure 5-4 CR Output controls and Control Room Output Panel

Dim and Cut

The Dim level can be set in the Control Room Output Panel by pressing the **Dim** key on the panel viewer and using the **Spin Knob** to adjust the level. This is the reduction in level (dB) that occurs when the **Dim** switch is active.

The Control Room Monitors may be switched off/on by pressing the output level knob's center switch or the **Cut** switch.

Monitors A-D may be switched off/on by pressing the output level knob's center switch; they are off when their output level knob's center LED is not lit.

Cut Individual CR Speakers

The Control Room speakers can be individually switched on and off. The **L**, **C**, **R**, **Sl**, **Sr**, **Bm**, **X and Y** keys in the Control Room Output Panel are lit when on. In addition, the LEDs above the CR Source LCD display light to show active speakers (see Figure 5-4).

Mon Lock

The **Mon Lock** key on the Bus Master Strip (Figure 7-1) disables the Control Room and Monitor levels. **Dim** and **Cut** always remain active.

Phase Reversal for Left and Right CR Speakers

The phase of the left Control Room speaker (Main, Alt1, Alt2) can be reversed by selecting the **LR Phase** key in the Control Room Output Panel for that output. The **LR Phase** key lights to indicate the left speaker's phase is reversed with respect to the right. The **LR Phase** LED to the left of the **CR Output** key also lights (see Figure 5-4).

CR Level

The Control Room speakers (Main, Alt1, Alt2) have a dedicated level knob and output level LCD display (see Figure 5-4) The knob LEDs also indicate the current level.

CR Speakers

There are three speaker outputs within the Control Room Monitors: Main (7.1), Alt1 (5.1) and Alt2 (stereo). The three switches below **CR Source** select between the three speakers; these switches are *after* the CR level, dim, and cut functions which affect all three speaker sets.

CR Format Folddown

The Main CR outputs may be folded down from their original format to one with fewer outputs using the keys on the right of the Control Room Output Panel (see Figure 5-4). The eMix software allows you to set folddown options (see *Folddown* on page 59).

Control Room Insert

This feature allows insertion of a Surround Matrix, equalizer, or compressor across the control room monitors. Activate the **CR Insert** switch at the bottom of the CR Output controls.

5.1.4 SLS/Cue Monitor Outputs

Mon A–D are usually used for SLS and Cue feeds. Each has its own level control and LCD display that shows the source and level when adjusted. The center knob switch turns the monitor on/off. These controls are shown on the left of Figure 5-3.

5.2 Communications

System 5's communication system includes:

- Two talkback microphone inputs (one mic included).

  Each input has 111 dB gain, phantom power, and compressor. They can be mounted anywhere but normally Tbk1 is mounted near the engineer and Tbk2 near the client. Talkback can be routed to Mon A–D, the Aux busses and the Mix sections (via the Slate function). Tbk2 shares the same routing as Tbk1 when it is turned on. Talkback can be remotely triggered to Mon A–D.

- Four listenback mic inputs.

  Each input has phantom power and compressor. They can be routed to the monitors and have individual level controls.

- Oscillator with Slate facilities.

  The oscillator has four fixed frequencies at 100 Hz, 440 Hz, 1 kHz, 10 kHz, and a user-selectable frequency. The oscillator can also generate pink or white noise. The oscillator can be routed to the Group, Aux, or Mix busses, or to all busses simultaneously. The Slate function combines Tbk1 and Tbk2 with the user definable tone to identify takes.

The Listenback mics are routed directly within the Monitor Interface (MC524) so they do not appear in PatchNet.

Access the communications facilities by pressing the **Comms Ctrl** key in the Solo Ctrl section to display the Comms:Talkback Panel (left of Figure 5-5). The bottom of the Panel has **Talk**, **Lsn**, and **OscSlt** keys to display Talkback (shown), Listenback (page 71), and Oscillator/Slate Panels (page 72), respectively. The Comms:Talkback Panel has an **Aux** key at bottom-right to set the talkback settings for the Aux busses. When displaying the Comms:Talkback:Aux Panel (right of Figure 5-5), this key changes to **Mons**, which switches back to the panel shown in the left of Figure 5-5.

5.2.1 Talkback

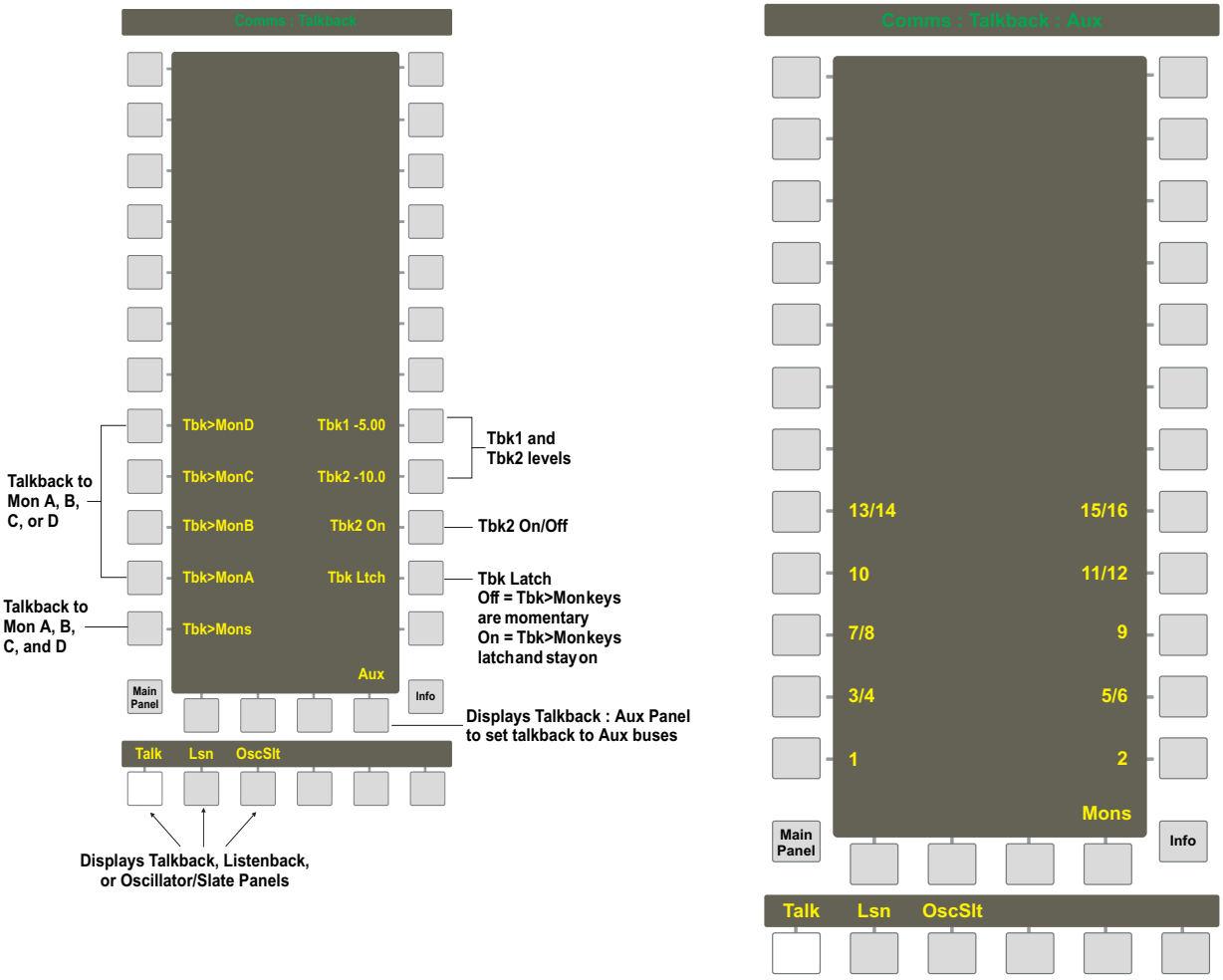


Figure 5-5 Comms:Talkback Panels

Monitors

Tbk1 and Tbk2 (if **Tbk2 On** is lit) can be routed to Mon A–D by pressing the **Tbk>MonX** keys on the left of the Comms:Talkback Panel. These keys are momentary unless **Tbk Ltch** is active, in which case they can be toggled on/off each time they are pressed. More than one monitor can be active by pressing multiple keys and all can be active by pressing the **Tbk>Mons** key.

Talkback is not routed to the Control Room speakers but the Main CR speaker and the monitors receiving talkback are dimmed by the level set for the **DIM** key (see *Dim and Cut* on page 67).

Set the Tbk1 level by activating the **Tbk1 xx.x** key and using the SpinKnob to adjust the level. Use the same process for Tbk2. Tbk1 is always on but Tbk2 must be turned on by activating the key below **Tbk2 xx.x** level.

Aux Busses

Press the **Aux** key at bottom right of the Comms:Talkback Panel to display the Aux busses. The same rules apply to the Aux Busses as monitors. Select the Aux Busses (single or pairs) to route the talkback signals. They latch or are momentary based on the **Tbk Ltch** setting and their levels are set on the Mons page.

5.2.2 Listenback

Press the **Lsn** key at the bottom of the Comms:Talkback Panel to display the Comms:Listenback Panel (Figure 5-6).

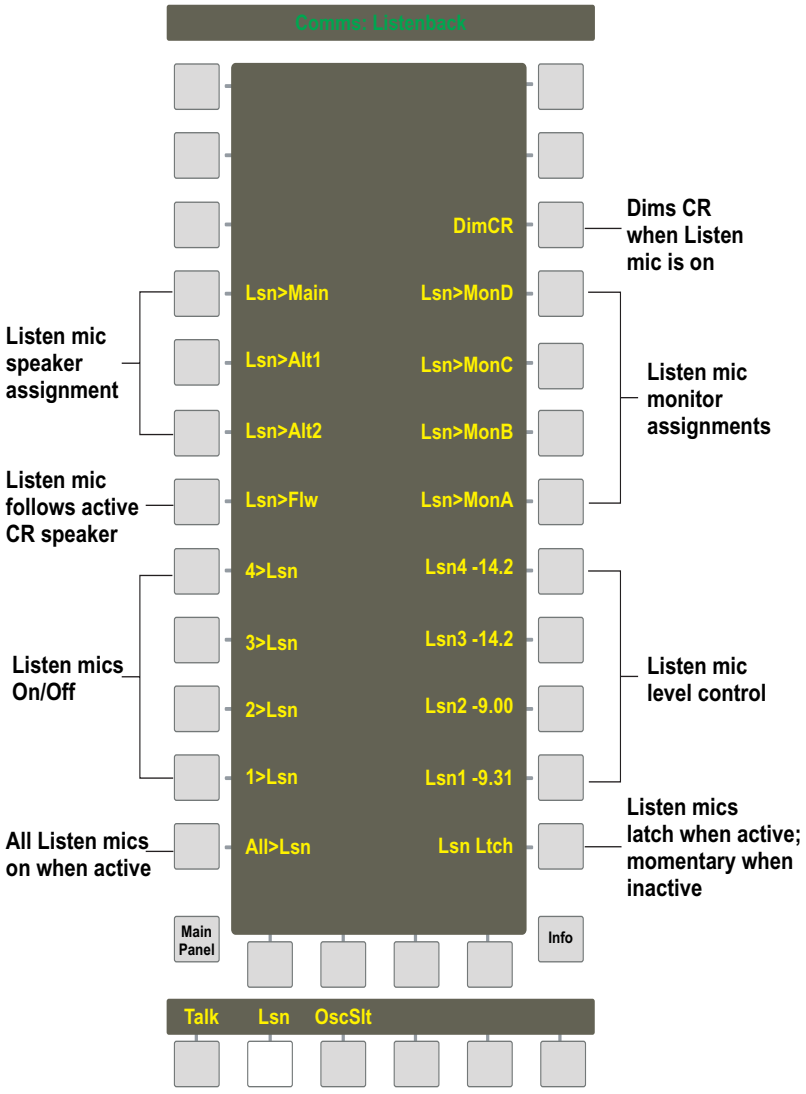


Figure 5-6 Comms:Listenback Panel

The listen mics can feed any combination of the CR Main, Alt1, Alt2, or Mon A–D speakers by activating their keys on the top half of the Panel. Activate **Lsn>Flw** to route the listen mics to the active CR Speaker.

Activate the **DimCR** key to dim the CR Speaker by the level set for the **DIM** key when the listen mics are on (see *Dim and Cut* on page 67).

Turn the listen mics on/off by pressing the **1>Lsn..4>Lsn** keys on the left of the Panel. Turn all listen mics on/off by pressing the **All>Lsn** key. The on/off keys are momentary unless **Lsn Ltch** is active.

Set the listen mic levels by pressing one of the **Lsn4..Lsn1 xx.x** keys on the right of the Panel and using the SpinKnob to set the level.

5.2.3 Oscillator/Slate

Oscillator

Press the **OscSlt** key at the bottom of the Comms:Talkback Panel to display the Comms:Slate/Osc Panel (Figure 5-7).

Turn the oscillator on by activating the **Osc>On** key. Select the oscillator type by pressing the **Osc>Sine**, **Osc>White**, or **Osc>Pink** keys on the top-right of the Panel. These keys intercancel so only one type can be selected at a time.

Select the oscillator frequency by pressing the **Osc>100Hz**, **Osc>440Hz**, **Osc>1kHz**, or **Osc>10kHz** keys on the left of the Panel. In addition, there is a user-selectable frequency key below the **Osc>10kHz** key. Activate this key and use the SpinKnob to set the frequency (20 Hz to 21 kHz). All of the frequency keys intercancel.

Set the oscillator level by activating the **Osc>xx.x** key (above **Osc>Grp**) and using the SpinKnob (111 dB of gain).

Slate

Set the Slate frequency by activating the **Slt>xx.xH** key and using the SpinKnob.

Set the Slate level by activating the **Slt>xx.x** key and using the SpinKnob (111 dB of gain).

Activate the **Slt>Grp** and **Slt>Mix** keys to route the Slate to Group and/or Mix Busses, respectively. Activate the **Slt>ALL** key to route the Slate to Group and Mix Busses.

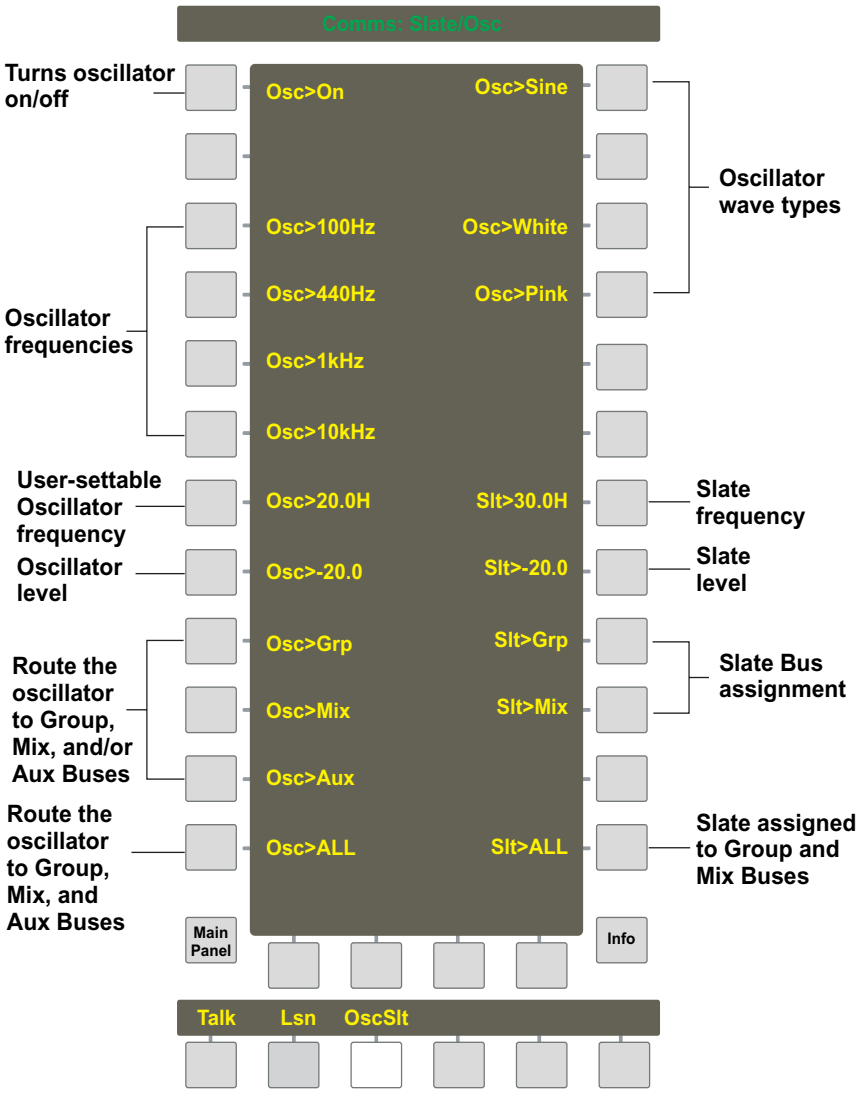


Figure 5-7 Comms:Slate/Osc Panel

5.2.4 Quick Access Communications Panels

The Quick Access Panel, located below the CR Level area, provides easy, fast access to the most commonly used Communications parameters without using the Panel Viewer. Use the buttons above the panel to display Quick Access Panels for general Communications, Talkback, Listen, and Slate/Osc (Figure 5-8).

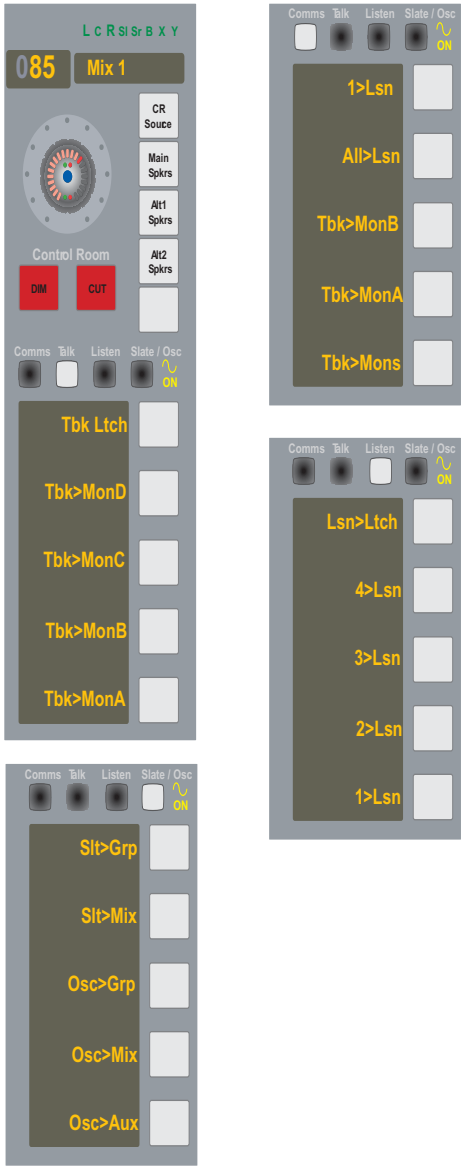


Figure 5-8 Quick Access Communication Panels

5.3 Solo

System 5 has an extensive solo control system that is accessed from the center section. Press the **Solo Ctrl** switch in the master Solo section to display the **Solo Control Panel**.

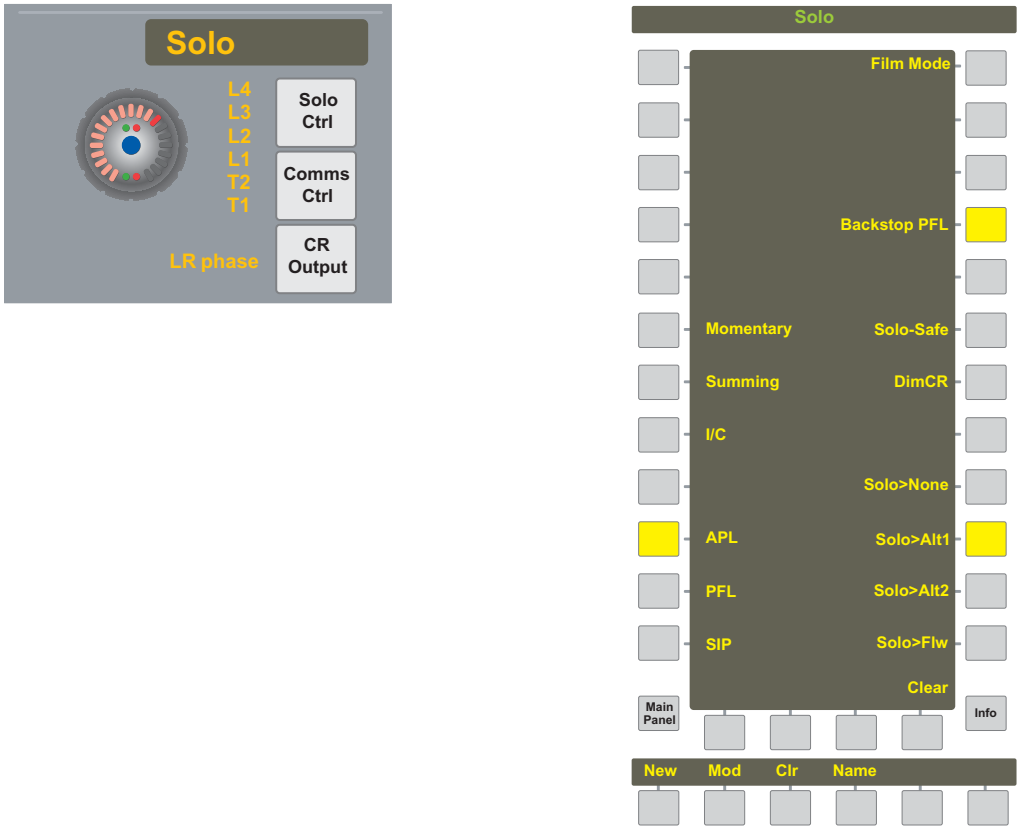


Figure 5-9 Master Solo section (top-left) and Solo Control Panel

5.3.1 Solo Mode

The three Solo modes can be selected by pressing their respective switches in the Solo Control Panel. Selecting one mode deselects the previous mode.

APL (After-Pan Listen): Signal is post-fader and pan (stereo)

PFL (Pre-Fader Listen): Signal is pre-fader in mono

SIP (Solo-In-Place): Allows Solo channels through to the mix busses. Mutes all channels not soloed but not channels designated **Solo-Safe** (page 77). This mode allows monitoring soloed channels with panning and effects if the effects returns have been designated Solo-Safe. We do not recommend this destructive solo mode for live broadcast or for recording a mix or dub.

Film Mode: Switches any mix busses in playback to bus temporarily so an SIP solo can be heard.

5.3.2 Solo Level

The **Solo** knob controls the solo level (APL and PFL modes) sent to the speakers or the Solo Output in PatchNet. The level is indicated on the LEDs surrounding the knob. The LED in the center of the knob flashes when a channel is soloed.

5.3.3 Solo Clear

All solo channels can be cleared using either of these methods:

- Press the switch in the center of the **Solo** knob.
- Press the **Clear** key on the bottom-right of the **Solo Control Panel**.

5.3.4 Intercancel, Momentary, and Sum

The **Solo** keys on the Strips *sum* by default: the **Sum** key in the **Solo Control Panel** is illuminated when first displayed. This means multiple channels can be soloed by pressing additional Solo keys; they must be explicitly cleared. There are two other options available in the **Solo Control Panel** that control the **Solo** key:

- **Momentary**: The Solo key must be held down but multiple channels can be active at a time.
- **Intercancel**: Pressing each new **Solo** key clears the last solo channel and activates the new one.

5.3.5 Solo Speaker Selection

The APL and PFL solo signals can be routed to the following speakers by activating their respective keys in the **Solo Control Panel**:

- **Solo>None**: The Solo signal is not sent to a speaker but can be routed using PatchNet.
- **Solo>Alt1**: The Solo signal is sent to the Alt1 speaker.
- **Solo>Alt2**: The Solo signal is sent to the Alt2 speaker.
- **Solo>Flw**: The Solo signal follows the active control room speaker selection (Alt1 or Alt2).

5.3.6 Solo Speaker Dim

In APL and PFL modes, the speakers not fed by the Solo signal can be dimmed. Press the **DimCR** key in the **Solo Control Panel**.

5.3.7 Solo-Safe

Solo-Safe is used with the SIP mode and has no effect in APL or PFL modes. SIP mode effectively mutes all channels except the soloed channel. Designating a channel Solo-Safe allows it through to the mix busses even when another signal is soloed. Solo signals can be heard with effects if the effects returns are designated Solo-Safe.

1. Press the **Solo-Safe** key in the **Solo Control Panel**.
2. Press the **Chan Select** key of the channel to make Solo-Safe.

   The **Chan Select** key flashes to show it has been made Solo-Safe. The channel's **Solo** key also lights dimly when in Solo-safe mode.
3. Press additional **Chan Select** keys.
4. Press the Solo-Safe key again or another **Solo Control Panel** key to exit the mode.

5.3.8 Backstop PFL

The System 5 faders have a backstop PFL switch past the bottom of their travel. Press **Solo Ctrl** on the Center Section to open the **Solo Control Panel** and select **Backstop PFL** to enable this feature. Pull and hold a fader past the bottom of its travel to route the signal's PFL level to the Solo bus. Release the fader to cancel its routing to the Solo bus. **Backstop PFL** does not affect normal solo operations and can be used on Control Group and Multi Format master faders to PFL a group of channels. Deactivate **Backstop PFL** in the Solo Control Panel to cancel the mode.

5.4 Meters

The System 5 meters are displayed on the TFT screen at the top of each Strip. Each Strip's meter can be set independently and can measure:

- **Channel**: the fader, Swap, Main, or any channel, even one not assigned to that Strip. There is an option to display two meters to track different information. When displaying one meter, the dynamics gain reduction is shown to the right of the channel meter (Figure 5-10).
- **Group, Mix, Aux**: Any Group, Mix, or Aux Bus.

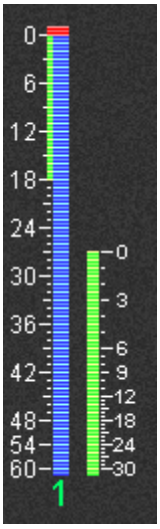


Figure 5-10 Channel meter with dynamics gain reduction meter on right

5.4.1 Meters Panel

From the Main Panel, press the **Meters** switch to display the **Meter Presets Panel** (left of Figure 5-11). Twenty four meter presets can be stored and recalled via the **Meter Presets Panel**. Before creating presets, configure each Strip's meters.

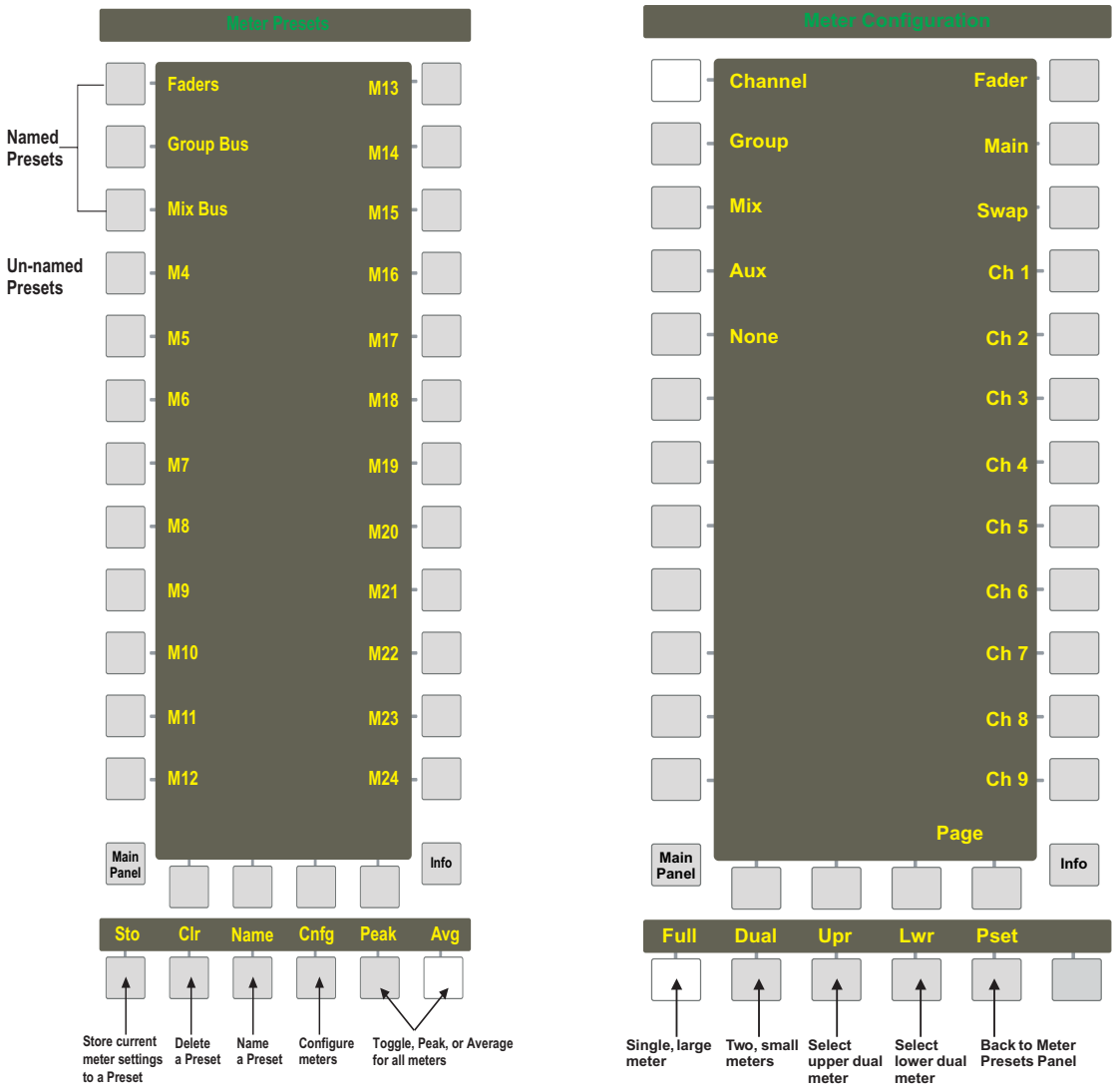


Figure 5-11 Meter Presets and Meter Configuration Panels

Meter Configuration

Press the **Cnfg** key at the bottom of the **Meter Presets Panel**. The **Meter Configuration Panel** appears (right of Figure 5-11). By default, the **Full** key (bottom-left) is lit, which selects one large meter; the **Channel** key is also lit, which displays the Channel options along the right side of the Panel. The double arrows (depicted opposite **Channel** in Figure 5-11) show what the right-side options pertain to (i.e., press **Group** to display Grp 1, Grp 2, etc. along the right side and the arrows appear opposite Group).

Each Strip can have a different meter configuration but it is also easy to assign the same configuration to consecutive Strips (with automatic incrementing).

To select one meter:

1. While displaying the **Meter Configuration Panel**, press Strip 1's **Wave** key.
2. Press the **Full** key from the bottom row to select one large meter.
3. Select **Channel** as the signal type for Strip 1's meter from the options on the left side of the Meter Configuration Panel.

   The right side of Figure 5-11 shows the relevant **Channel** options. Group, Mix, and Aux have different options.
4. Select **Fader**, **Main**, **Swap**, or **Ch #** to assign the signal to meter.

   Fader: Meter measures whatever the fader controls (i.e., the active Swap/Main channel). Despite the name, the signal is measured pre-fader.

   Main: Meter measures the Main channel even when Swap is active.

   Swap: Meter measures the Swap channel even when Main is active.

   Ch #: Meter measures the assigned channel even if it is not assigned to that Strip.

NOTE: *It is most common to meter the Fader, Main, or Swap signals. The TFT meter and fader meter follow the meter source point as set in the path order (see page 110).*

To select dual meters:

1. While displaying the **Meter Configuration Panel**, press Strip 1's **Wave** key.
2. Press the **Dual** key from the bottom row to select two, small meters.

   The **Dual** and **Lwr** keys light.
3. Press the **Channel** key on the left side.
4. Press the **Fader** key on the right.

   The lower meter now measures the signal applied to Strip 1's fader.
5. Press the **Upr** key to set the upper meter's options.
6. Press the **Group** key on the left side.

   The double arrows move down to appear opposite **Group**. The options change along the right side to Grp 1, Grp 2, etc.
7. Press the **Grp 1** key on the right side.

   Strip 1's upper meter now measures the Group 1 Bus.

To select the same meter configuration for multiple Strips, press another Strip's **Wave** key after configuring the first Strip. Because each meter's signal is automatically incremented by one, set the lowest numbered Strip first and then set additional Strips consecutively. For the dual meter example above, pressing Strip 2's **Wave** key assigns Group Bus 2 to the upper meter and Strip 2's fader to the bottom meter. If Strip 3's **Wave** key was pressed instead of Strip 2, Group Bus 2 would still be assigned to Strip 3's upper meter.

5.4.2 Master Section Meters

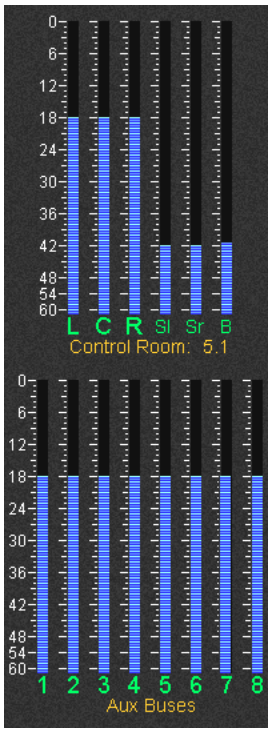


Figure 5-12 Master section meters showing 5.1-channel CR and Aux Busses 1–8

The TFT screen above the center section shows two meters, one above another. The upper meter automatically shows the selected monitor output format. For example, if the Control Room monitors Mix Bus A and it is a 5.1-channel format, the meter automatically displays 5.1 channels.

The lower meter automatically displays whatever is currently assigned to the Bus Master Strip: Aux, Mix, or Group Masters, Mon A, B, C, D, or Solo Master. The meter displays the eight meters corresponding to the Bus Master knobset. If there are more than eight masters, use the ◀▶ keys on the Bus Master Strip to change pages. For example, if Group Bus Masters 9–16 are on the knobset, the meters display these automatically. Press the **Mon A–D Source** or the **Solo Ctrl** switches to meter these signals on the lower meter.

Chapter 6: CM402 Center Section

The CM402 module (Figure 6-1) is located to the left of the CM401 Master Section that contains the Center Strip. The purpose of the CM402 is to expand access to Strip functions so they are more readily available than from the normal Strip. It includes the following functional sections, from top to bottom:

- Bus Routing and Track Arming Panels

  See *Bus Routing Panel* on page 88 and *Track Arming* on page 150.

- Aux, Input, and Filters knobsets with select panel

  The Select Panel determines which functions of the Center Strip's channel are displayed on the knobsets.

- Dynamics and EQ knobsets

  The Center Strip channel's dynamics and EQ are always displayed on these knobsets.

- Channel Select Panel
- Eight assignable Strip faders

  These are traditionally used for Control Groups but any channel can be assigned using the same techniques used to assign a Strip on the CM408.

Any Strip on the console can be displayed on the Center Strip by pressing its **Wave** key. The Channel Select Panel can also assign channels to the Center Strip.

Once a Strip has been assigned to the Center Strip,

- reassigning the Swap or Main channels on the original Strip is not reflected in the Center Strip.
- reassigning the Swap or Main channels on the Center Strip is not reflected in the original Strip.
- the original Strip can still control all its functions.

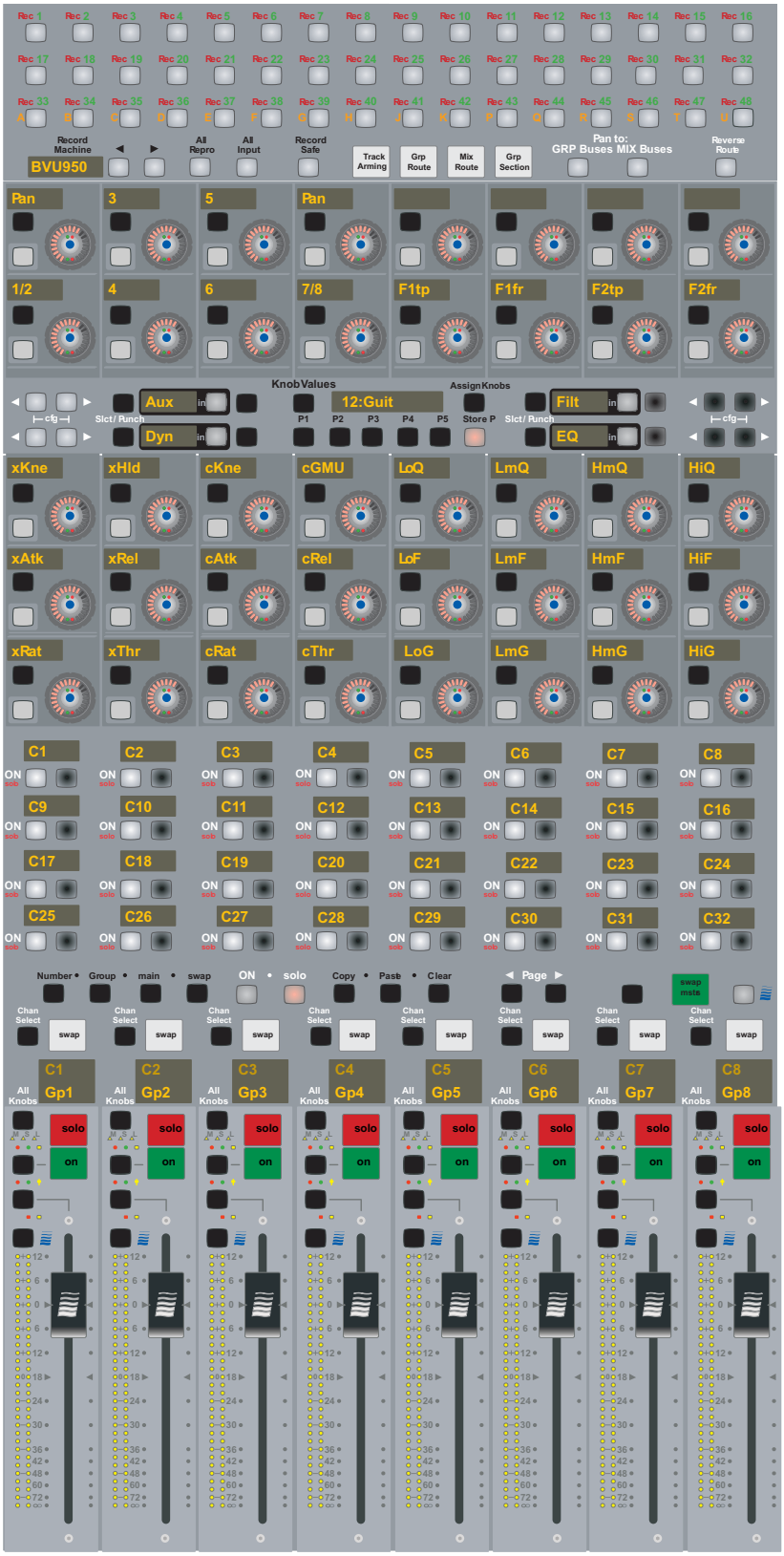


Figure 6-1 CM402 Center Section

6.1 Channel Select Panel

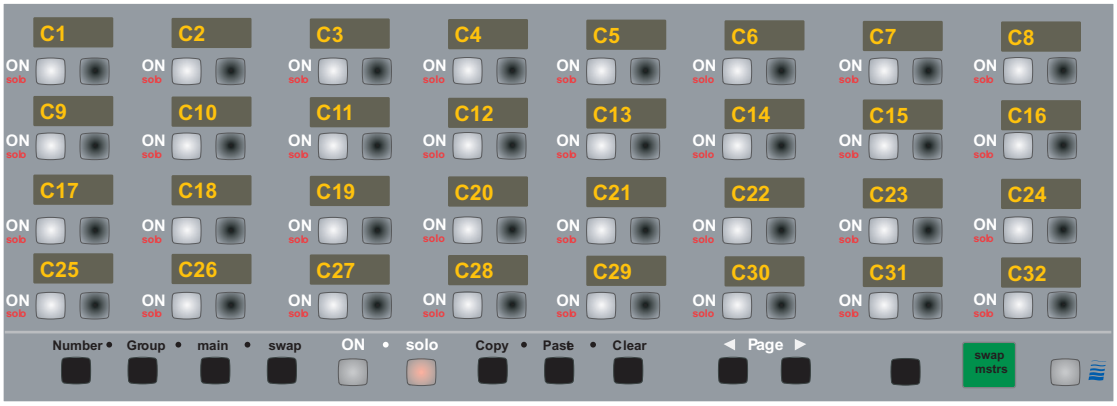


Figure 6-2 Channel Select Panel

The Channel Select Panel provides easy physical access to any channel or Control Group in your System 5 configuration. It defaults to displaying the first 32 channels, each with a four-character LCD display, **ON/Solo**, and **Channel Select** keys.

- The **Page** keys display additional channels in groups of 32. If the **Scroll** key is lit, the **Page** keys display one new row of channels (eight) instead of 32.
- The right key beneath each channel's LCD display assigns that channel or Control Group to the Center Strip, replacing the channel in the active layer (Swap or Main). This key functions identically to a CM408 Strip's **Wave** key.
- The **Number** key toggles between displaying the channel or Control Group number (key is lit) and the name.
- The **Group** key toggles between displaying channels and Control Groups (key is lit).

The global **ON** and **Solo** keys on the bottom of the panel determine whether the left key on each channel's controls performs an On/Off or Solo function. The **ON** and **Solo** keys cannot be lit simultaneously and intercancel:

- If **ON** is lit, the key turns the Control Group or Channel On/Off.
- If **Solo** is lit, the key Solos the Control Group or Channel.
- If both are unlit, the key has no effect.

NOTE: *The* **Wave** *key at the far right of the Channel Select Panel is not functional.*

6.2 Knobset Panels

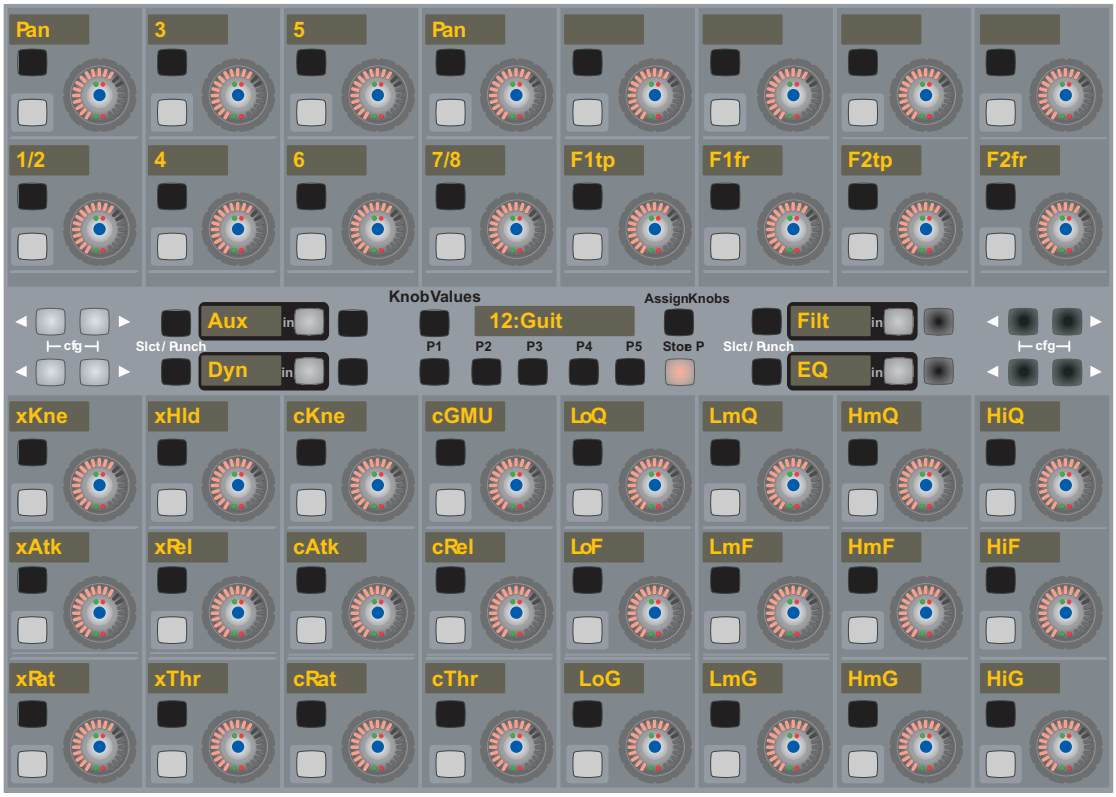


Figure 6-3 Center Panel knobsets

The Center Section's knobsets extend access to the Center Strip's functions. The two panels of 16 (4x4) knobs above the Channel Select Panel are dedicated to dynamics (left) and EQ (right). The two panels of 8 (2x4) knobs above the Knobset Control Panel display different combinations of Aux, Input, and Filters depending on the preset selected from the Knobset Control Panel.

6.2.1 Knobset Control Panel

The Knobset Control Panel configures the knobs above the panel and which pages of Dynamics and EQ appear below it. The Input and Aux functions have configuration pages which can be accessed by pressing both **cfg ◀▶** keys simultaneously (see Section 8.4 - *Channel Processing Functions* for details about the configuration pages). The LCD display in the center of the panel shows the current Center Strip channel.

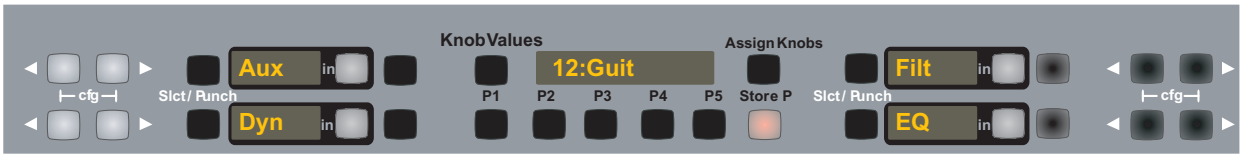


Figure 6-4 Knobset Control Panel

The **Knob Values** key toggles between showing the parameter name in each knob's LCD display (unlit) and the parameter value (lit). The LCD always displays the value when the knob is adjusted but reverts to the name unless **Knob Values** is lit.

The five Preset keys configure the two panels of eight knobs above the Knobset Control Panel. The current preset key remains lit and the top two (right and left) LCD displays show the selected functions. The bottom two LCD displays are fixed at Dynamics and EQ.

Table 6-1 Center Panel Knobset Presets

Preset #	Left	Right
1	Aux	Filters
2	Aux	Input
3	Input	Filters
4	Aux	Aux
5	Input	Input

The **Slct/Punch** switch punches the knobset in during automation or selects it for inclusion in a Snapshot. The **In** key switches the function In (lit) and Out (unlit). The switch to the right of the **In** key is the **Select/Punch** for the **In** key.

All knobset functions and displays are discussed in Section 8.4 - *Channel Processing Functions*.

NOTE: *The* **Store P** *and* **Assign Knobs** *switches are not currently operational.*

6.3 Bus Routing Panel

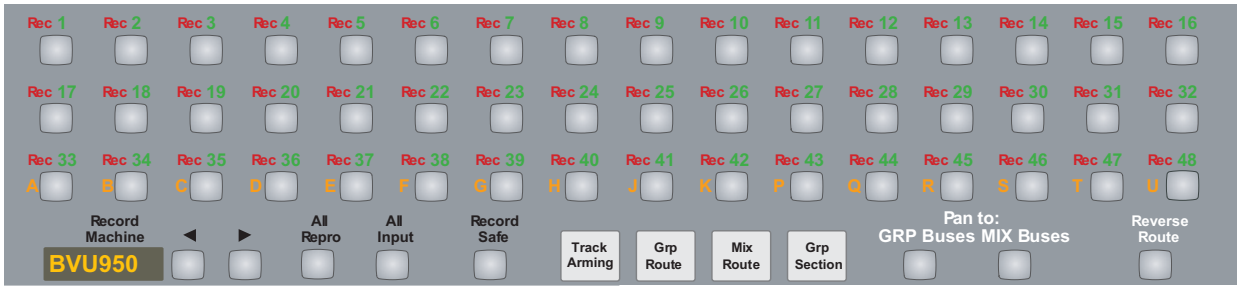


Figure 6-5 Bus Routing Panel

This panel shows the Group and Mix Bus routing for channels assigned to the Center Strip. The **Track Arming**, **Grp Route**, **Mix Route**, and **Grp Section** switches along the bottom of the panel determine the information being displayed and controlled. These switches intercancel: only one can be lit and active at a time. The **Pan To: GRP Busses** and **MIX Busses** keys switch pan in/out for the Group and Mix Busses.

NOTE: *The* **Reverse Route** *switch is not currently operational.*

6.3.1 Grp Route

All 48 switches indicate Group Bus routing. The green number LEDs light to indicate the available busses. The switches light to show that the Center Strip channel is routed to that Group Bus.

6.3.2 Mix Route

All 48 switches indicate Mix Bus routing. The green number LEDs light to indicate the available busses. The switches light to show that the Center Strip channel is routed to that Mix Bus.

6.3.3 Grp Section

This is the default mode of operation. The top two rows indicate Group Bus routing. The bottom row is used for the 16 Mix Busses.

6.3.4 Track Arming

This mode allows track arming up to 48 tracks of a record machine.

Chapter 7: Busses and Bus Masters

7.1 Introduction to System 5 Busses

The number of processing cards in the DF64 digital frames and the Mixer Model determine the number of busses and channels available in your System 5 configuration: more channels = less busses and vice versa. See *Mixer Model* on page 56 for a complete discussion of these system resource issues.

The System 5 has four bus types: Mix, Group, Aux, and Solo.

Mix Busses

A maximum of 48 Mix Busses can be configured in up to 16 Mix Sections. Each Mix Section can have between one and eight individual busses (i.e., a stereo pair = two individual and an LCRS set = four individual) and can be set to any format. Mix Busses have playback returns; Aux and Group busses do not.

Group Busses

Group Busses are used to route channels to multitracks, DAWs, mix-minus feeds, and sub-groups. Group Busses can be configured to any format but are usually set to odd/even stereo pairs. With Pan switched out, they act as mono assign busses.

Auxiliary Sends

Aux sends are used for effects, foldback, and mix-minus feeds. Aux sends can be configured as mono or stereo pairs and can be pre- or post-fader.

Solo Busses

The Solo bus is fixed at stereo. After-Pan Listen (APL) and Pre-Fader Listen (PFL) route signals to the Solo Bus. Each Strip's fader also has a Backstop PFL function: move and hold the fader past the bottom of its travel to activate the PFL Solo mode (see *Backstop PFL* on page 106). Solo In Place (SIP) is a destructive Solo mode and does not use the Solo busses. See *Solo Mode* on page 75 for more information on SIP.

7.2 Bus Master Functions

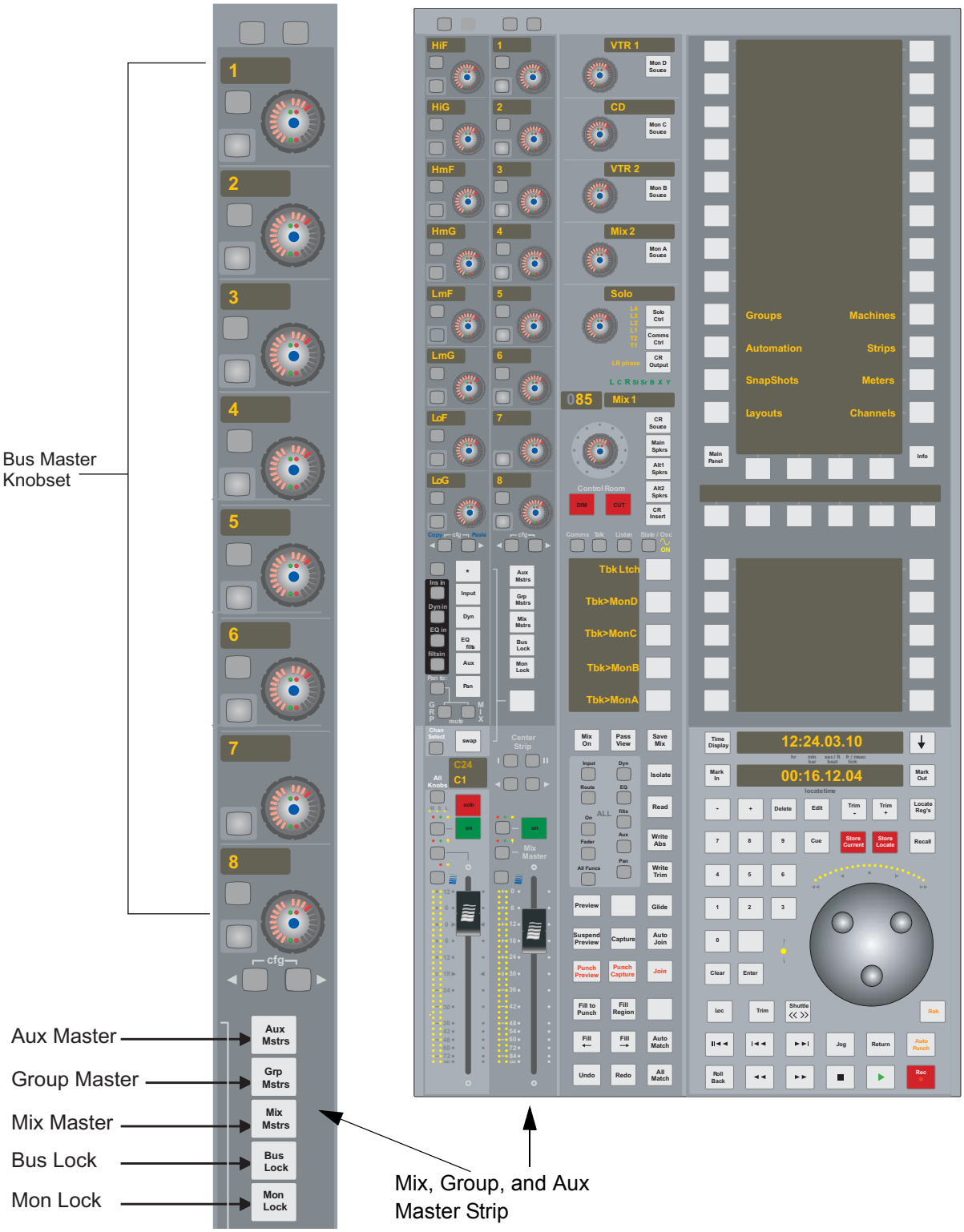


Figure 7-1 CM401 Center Section with Bus Master Strip

The Bus Master Strip has eight knobs and five function keys to control all Bus Master functions.

7.2.1 Aux, Grp, and Mix Masters

Press the **Aux Mstrs**, **Grp Mstrs**, **Mix Mstrs** keys (**Figure 7-1**) to display the Aux Bus, Group Bus, or Mix Bus functions, respectively, on the Bus Master knobset.

7.2.2 Bus Lock

The **Bus Lock** key disables the following functions when activated: Bus Levels (Mix Master, Master Trims, and Leg Trims), Bus Inserts, Bus On/Off switches.

While these functions are disabled, their values may still be interrogated.

7.2.3 Mon Lock

The **Mon Lock** key disables the Control Room and Monitor levels. **Dim** and **Cut** always remain active. See *Monitoring* on page 64 for more information on monitor controls.

7.2.4 Mix Bus

Press the **Mix Mstrs** key to bring the mix bus sections onto the Bus Master knobset. The Master Fader controls the overall Mix section levels. Each Mix section has its own level control as well as trim controls for each Mix Bus in its selected format (see *Busses* on page 54 to see how to set the format). Relative levels are maintained when adjusting the Mix Bus Master or Mix Bus section level until a maximum or minimum value is reached.

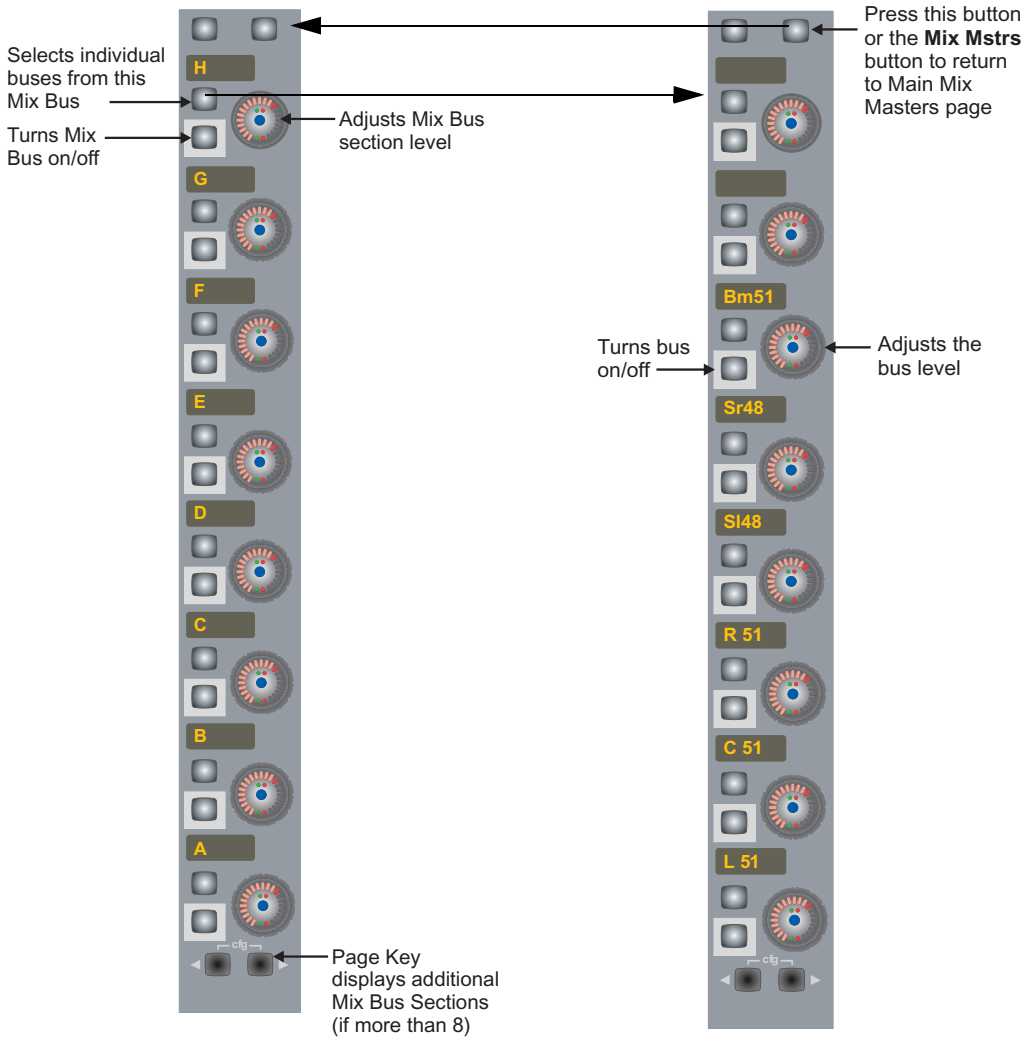


Figure 7-2 Mix Bus Master (left) and Individual Bus (right) Displays

The left side of Figure 7-2 shows the Mix Bus Master display after pressing the **Mix Mstrs** button (or the top-right knobset function key next to **Clear**). The important functions are summarized below:

- Press the upper of the two buttons to the left of each knob to display the individual busses for that Mix Section.
- Adjust the knob to control the overall level of that Mix Bus.
- Press a knob to display individual Section meters on the TFT screen.
- Press the lower of the two buttons to the left of each knob to turn that Mix Bus On/Off. All individual bus parameters are retained if the Bus is turned on after being off.
- Use the ◀ and ▶ buttons to display additional pages if there are more than eight busses.

Individual Mix Busses

The right side of Figure 7-2 shows the individual Mix Bus display selected by pressing the upper of the two buttons to the left of each knob. The important functionality is summarized below:

- Press the lower of the two buttons to the left of each knob to turn the individual bus On/Off. Its level is retained if that bus is turned on after being off.
- Adjust a knob to set the level for that bus.

7.2.5 Group and Aux Busses

The Group and Aux Bus Masters have the same controls. Press the **Grp Mstrs** or **Aux Mstrs** button to display the first eight Group or Aux Bus Masters. Use the ◀ and ▶ keys to display additional busses. The knobs control the bus levels and the lower button to the left of the knob turns that bus on/off. See *Law Palette* on page 55 to learn how to select the format.

7.2.6 Configuring Mono/Stereo Aux Busses

The Aux Busses can be configured as mono sends (default) or odd/even stereo pairs. To configure Aux busses 1 and 2 as a stereo pair:

1. With the Aux Busses on the Bus Master knobset, press both **cfg** ◀ and ▶ keys simultaneously.

   Both **cfg** keys flash to designate the Aux Bus configuration mode. These keys are usually pressed individually to page between groups of eight busses.

2. Press the switch in the center of the knob for Aux Bus 1 or 2.

   The Aux Bus 1 and 2 knob LEDs turn blue.

3. Press the **Aux Mstrs** key to return to the Aux Bus Master display.

   The two channels are now displayed as shown below.

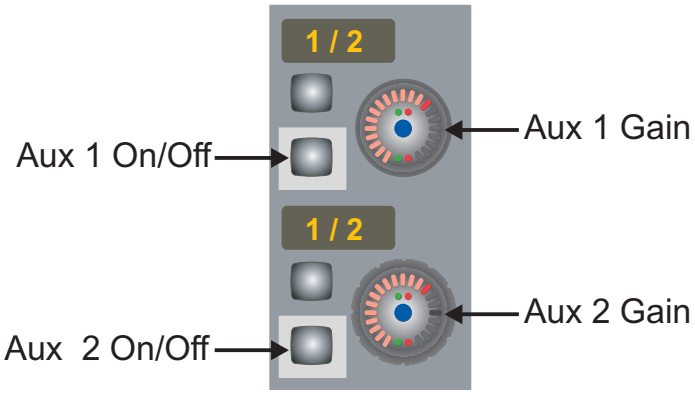


Figure 7-3 Aux busses 1 and 2 linked as stereo pair

7.2.7 Bus Master Inserts

Each Group, Mix, and Aux Bus has an insert point. See *Mix Bus Send/Return* on page 52 to learn about bus insert send and returns specified in PatchNet. Switching the insert in/out works the same for Aux, Mix, and Group busses.

1. Press the **Aux Mstrs**, **Grp Mstrs**, or **Mix Mstrs** button to display that bus on the Bus Master knobset.
2. Press both **cfg** ◀ and ▶ keys simultaneously.
3. Press the lower button to the left of the knob to activate that bus insert (*In:* button lit). Press the button again to deactivate the bus insert (*Out*: button not lit).

7.3 Mix and Group Bus Setup

See *Busses* on page 54 to learn about how to configure the Mix and Group Busses.

Chapter 8: Channels and Strips

8.1 Strips

A CM408 module contains eight identical Strips, each with a Main and Swap channel with independent settings. The Strip is the physical control area on the console that contains switches, knobs, displays, and a fader. Figure 8-1 shows a Strip with its meter and status displays that appear on the meter bridge above the channel, and block diagrams for the Swap and Main channels.

System 5 provides tremendous flexibility in how channels are assigned to Strips and how the Strip controls the channel:

- Any channel can be assigned to any Strip; assignments need not be consecutive.
- Two Strips can control one channel, allowing two users to simultaneously operate that channel.
- Channels with related functions, such as individual drums or drum submixes, can be assigned to neighboring Strips.
- Channel-to-Strip mappings can be named, stored, and recalled as **Layouts** (Section 10.1 - *Layouts*).
- Channel settings can be named, stored, and recalled as **Snapshots** (Section 10.2 - *Snapshots*).

A 96-channel, 48-Strip configuration could map all channels to the control surface: **Main** (channels 1–48 to Strips 1–48); **Swap** (channels 49–96 to Strips 1–48). A 96-channel, 24-Strip System 5 configuration cannot map all channels to the console at once but could use two Layouts to easily interchange all channels.

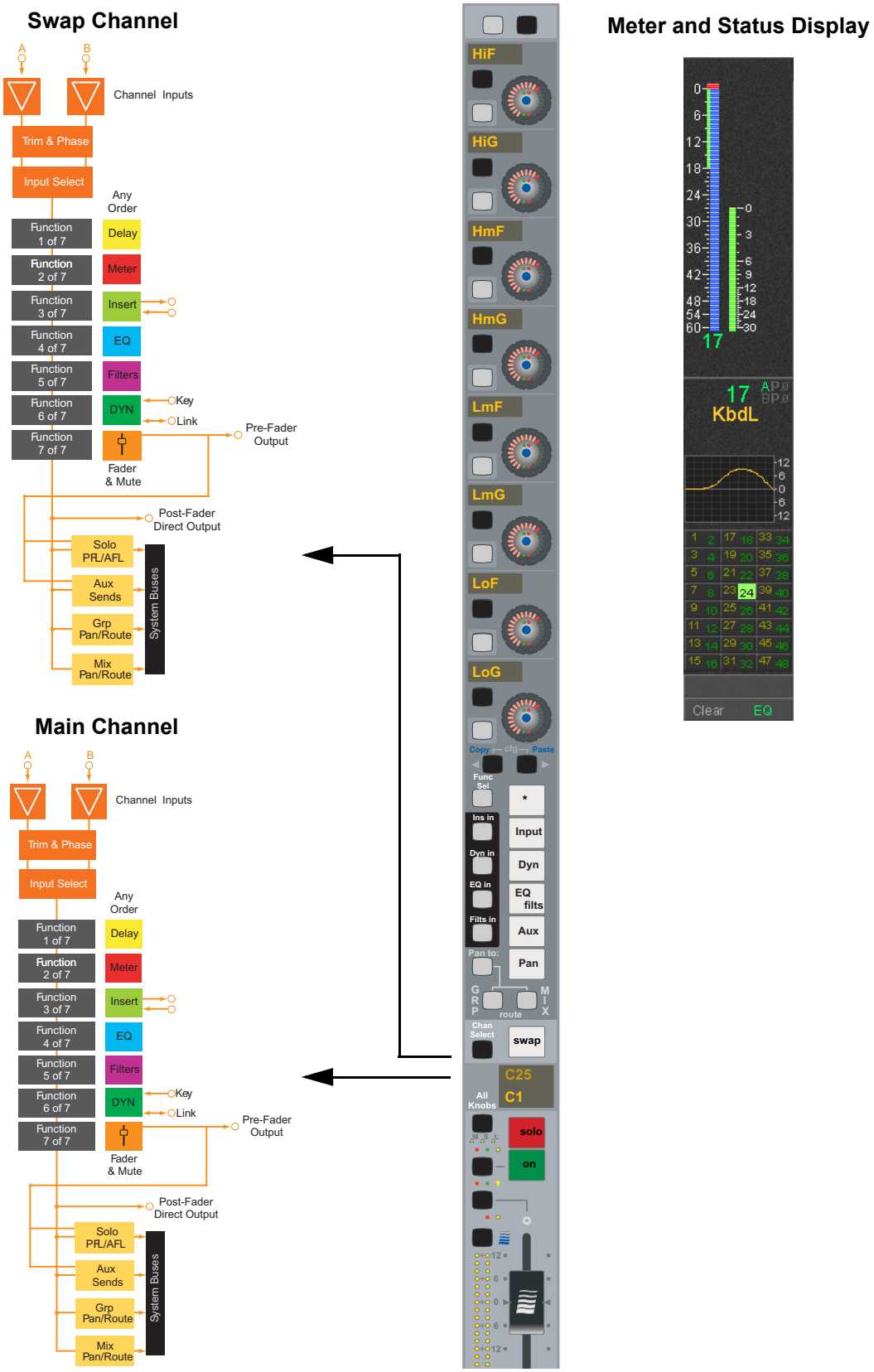


Figure 8-1 The Strip with block diagram for Main/Swap channels and meter/status display

8.1.1 Map Channels and Control Groups to Strips

Each Strip can control a Main and Swap channel. One or both of the channels can be a Control Group instead of a normal channel. Channels can be assigned individually using the Strip controls or to multiple Strips using the **Channel Assign Panel** (page 98).

Individual Assignment: Strip Controls

The **Chan Select** key can be used to assign individual channels to a Strip on the console surface:

1. Access the Main or Swap level to assign the desired channel.
2. Press and hold down the **Wave** key and press the **Chan Select** key.

   The channel list appears on the meter bridge screen at the top of the Strip. Control Groups that have been created also appear in the list. The **Accept** and **Abort** keys flash (see Figure 8-2).

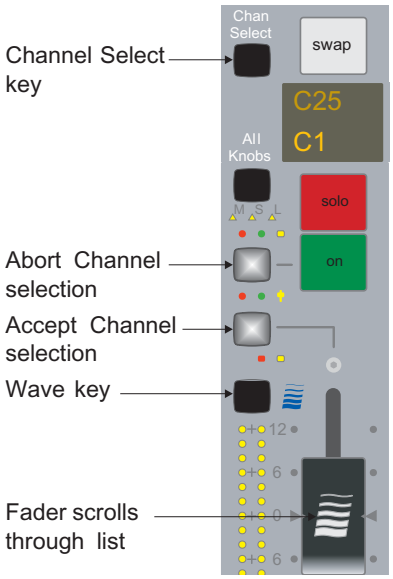


Figure 8-2 Strip controls during channel assignment

3. Use the fader to scroll through the list of channels and Control Groups on the screen; the highlighted entry is selected.
4. Press the **Accept** key to assign the selected channel or the **Abort** key to cancel.

To assign the Swap channel, press the **Swap** key and begin with step 2.

Multiple Assignments: Channel Assign Panel

The **Channel Assign Panel** is most commonly used to assign channels to multiple Strips but can also be used for a single assignment.

1. Press the **Main Panel** key in the center section.
2. Press the **Channels** key to display the **Channel Assign Panel**.

   Use the **Page** keys to display additional channels.

Figure 8-3 Channel Assign Panel

3. In the **Channel Assign Panel Viewer**, press the key beside the channel you wish to assign.
4. Activate the Main or Swap channel on the Strip you wish to assign the selected channel and press its **Chan Select** key.

Shortcut Assignment for Multiple Channels

Use the following procedure to assign multiple, consecutive channels to the console surface:

1. Press the **Main Panel** key at the bottom of the **Panel Viewer**.
2. Press the **Channels** key in the **Main Panel** to display the **Channel Assign Panel**.
3. In the **Channel Assign Panel**, press the **Auto** key so it illuminates and the key beside the channel to designate as the starting channel.
4. Position your finger over the **Chan Select** key for the first Strip (left-most) you would like to assign on the console.

   Because this technique requires a two-key sequence beginning with **Chan Select** and moving to the right to the **Swap** key, the first Strip *must be at the far left of those being assigned*.
5. Begin by pressing the **Chan Select** key on the first Strip, but continue moving your finger to the right across to the **Swap** key of the same Strip.
6. Continue sliding your finger to the right over the **Chan Select** and **Swap** keys of each Strip until you have pressed the **Swap** key on the last Strip you wish to assign.

   You have just assigned the Main level on each Strip by pressing its **Chan Select** key. Pressing its **Swap** key enables that Strip to assign its Swap level in step 7.
7. Move your finger back to the first Strip's **Chan Select** key and repeat the same sequence of key presses.

   You have mapped the next series of channels to the Swap level on the same Strips on which you set the Main levels.

For example, if the first sequence mapped channels 1–8 to the Main level on eight Strips, the second sequence would map channels 9–16 to the Swap level on the same eight Strips.

8.1.2 Input Names or Channel Number

You can choose whether to display a channel's number or its input names.

1. Press the **Channels** key in the **Main Panel**.
2. Press the **Setup** key in the **Channel Assign Panel**.
3. Use the **Show Input Name** key to toggle between displaying the channel number and the names patched into the channel's A and B inputs.

8.1.3 Strip Utilities

System 5 provides several useful utilities to operate efficiently with Strips: **Strip Lock**, **Strip Expand, Spill, Fader Unity,** and **Fader Meters** (Figure 8-4).

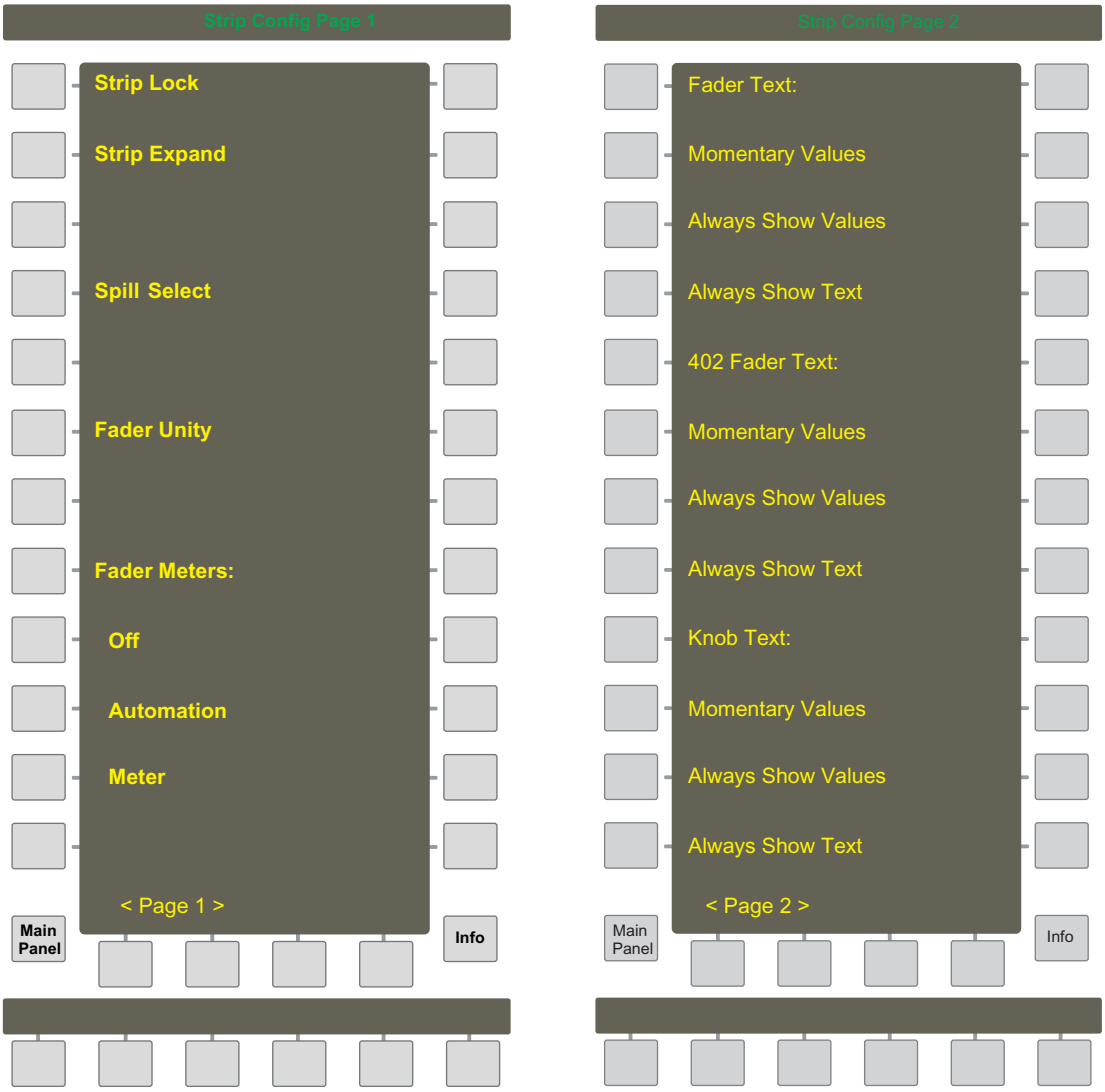


Figure 8-4 Strip Config panel

Strip Lock

Strip Lock prevents Strip assignments from being changed when a Layout is recalled or when the **All** function is active for another channel.

To activate **Strip Lock**:

1. Press the **Strips** key in the **Main Panel Viewer**.
2. Press the **Strip Lock** key at the top-left of the **Strips Panel Viewer**.

   The key flashes when active.
3. Press the **Wave** key on each Strip to lock it.

   The red **Strip Lock** LED (above the **Wave** key) illuminates to show the Strip is locked. Press the **Wave** key again to unlock it.

   The TFT display shows **Locked** above that Strip.

Strip Expand

Strip Expand expands the display and control of a single Strip over several Strips, permitting easier access to knobset functions (i.e., one Strip has EQ, the next Dynamics, etc.). Changes to the Main or Swap level affects all expanded Strips. **Strip Expand** is also useful for showing multiple Aux send pages when there are more than eight aux sends.

To expand a Strip:

1. Press the **Strips** key in the **Main Panel Viewer**.
2. Press the **Strip Expand** key in the **Strips Panel Viewer**.

   The key illuminates when active.
3. Press the **Wave** key on the Strip to expand.

   The **Wave** key illuminates.

   The yellow **Strip Expand** LEDs (above the **Wave** key) illuminate to designate the expanded Strips.

Spill Select

Spill Select allows Control Groups and Multi Format Masters to *spill* their slaves to a defined area (see *Spill Area* on page 133 to learn how to spill the channels).

To specify a spill area:

1. From the **Main Panel**, press the **Strips** key.
2. In the **Strip Config Panel Viewer**, press the **Spill Select** key so it lights.
3. Press the **Wave** key for each strip that is to be part of the spill area.

Fader Unity

Fader Unity allows any fader(s) to be automatically set to unity gain (0 dB).

1. From the **Main Panel**, press the **Strips** key.
2. In the **Strip Config Panel Viewer**, press the **Fader Unity** key so it lights.
3. Press the **Chan Select** key for each channel to set unity gain.

   The fader moves to 0 dB.

   You can also press that channel's **Channel Select** key in the center section Select Panel.

Figure 8-5 Center section Select Panel

4. Deselect the **Fader Unity** key to turn off the Fader Unity function.

Fader Meters

The **Fader Meters:** parameter controls what the Strip fader's LEDs measure and can be set using the keys that appear below and indented from the **Fader Meters:** key.

Off: Turns the Fader Meters off so nothing is displayed.

Meter: Displays the channel's input level on the right meter only. This is the PFL input level, not the fader position.

Automation: Displays the underlying fader position while recording automation. When the fader is punched out, the LEDs turn off. In **Write Abs** mode, the underlying absolute level is displayed while recording new automation. Underlying levels are also displayed when a fader is in Preview or Suspend modes while touching the fader. See *Automation Modes* on page 172.

Knob and Fader Text Displays

There are nine options in the Strips Config Panel to choose between values and names on the text displays for knobs and faders:

- Knobs - momentary, show name or show value
- Fader - momentary, show name or show value
- 402 Faders - momentary, show name or show value

8.2 Channel Control Features

8.2.1 Channel Name

The Main and Swap channels are designated by a number (C# by default) or by a four-character name assigned in the **Channel Assign Panel** (see page 98). The Main channel is below the Swap channel; the *active* channel's display is brighter. Press the **Swap** key to switch between the Swap and Main channels. The Strip controls only the active channel.

8.2.2 Function Keys

The **Routing**, **Input**, **Dynamics**, **EQ/Filters**, **Aux Sends**, and **Pan** functions can be assigned to a Strip's eight rotary knobs by the five switches below the knobs. If the function has more than eight parameters, the ◀▶ keys (above * key) page backward and forward to display the additional settings. Four function in/out switches are located to the left of the function selection switches.

8.2.3 Rotary Knobs

Each Strip has eight illuminated, rotary knobs each with a four-character display and two switches. The knob is a continuous controller; as the knob turns, the LEDs on the outer ring light to show the current relative level. The display shows the knob's current function except while adjusting the knob, when it shows the parameter's value.

The lower switch to the left of the knob toggles the knob's function in/out.

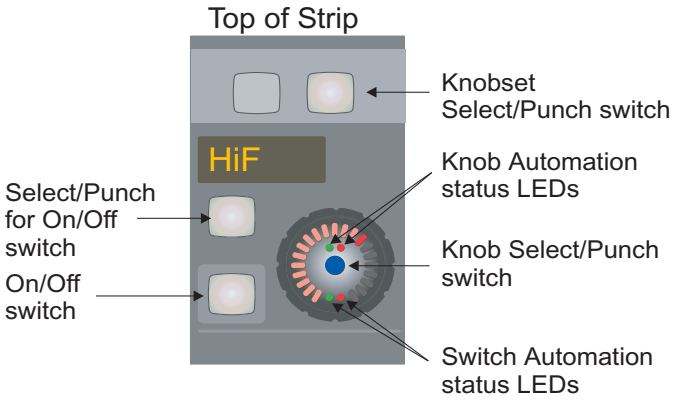


Figure 8-6 Rotary Knob Controls

Select/Punch Keys

There are several **Select/Punch** keys on a Strip that operate on different levels:

- At the top of the strip (see Figure 8-6), the **Knobset Select/Punch** key selects or punches all knobset parameters for the currently selected function, including knobs and switches.
- The upper switch to the left of the knob is the **Select/Punch** key for the **On/Off** switch below it. When the transport is moving, it is the punch-in/out key for the **On/Off** switch. This key is also used to select the **On/Off** switch for inclusion in a Snapshot and pages to a second knob function, if it exists.
- Each knob has a center switch that punches the knob in/out during automation. It also selects that knob for inclusion in a Snapshot. When not in automation, tapping the knob switch shows the value in the display instead of the function name.

8.2.4 Touch-Sensitive Fader and Controls

Each Strip has a touch-sensitive fader that moves automatically in response to recorded automation. When the fader is touched, the Fader touch-sensor LED lights and automatically punches it into automation (the **Select/Punch** key also punches the fader in/out). The Fader Automation Status LEDs show the automation mode status for the fader.

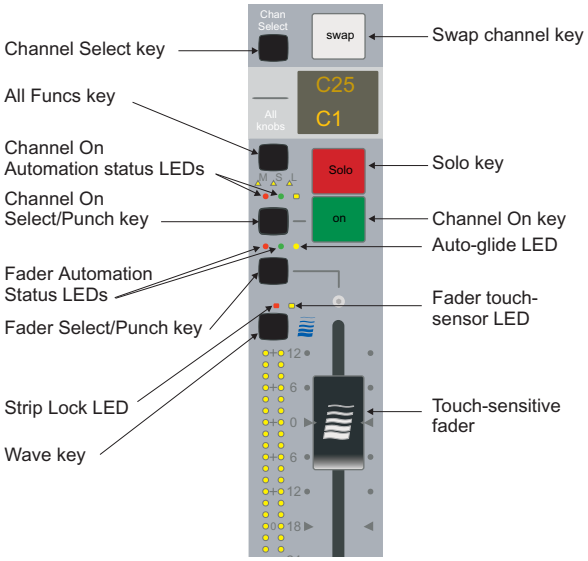


Figure 8-7 Fader Controls

Backstop PFL

The system 5 faders have a backstop switch past the bottom of their travel. Press **Solo Ctrl** on the Center Section to open the **Solo Control Panel** and select **Backstop PFL** to enable this feature. Then pull and hold a fader into the backstop to route the signal's PFL level to the Solo bus. Release the fader to cancel that fader's routing to the Solo bus. **Backstop PFL** does not affect normal solo operations and can be used on group masters to PFL a Control Group. Deactivating **Backstop PFL** cancels the mode

8.2.5 Wave Key

The **Wave** key has three functions:

- Press the **Wave** key to bring the Strip (both Swap and Main channels) to the center Strip (see Chapter 6: *CM402 Center Section*).
- Press the **Wave** key when selecting Strips and channels for Layouts, Strip Expand, Strip Lock, or other operations.
- Like a shift key, the **Wave** key modifies other keys.

  See Section 13.4.2, 13.4.3, 13.4.4, and 8.2.8 for examples.

8.2.6 All Mode

When **All** mode is active on a Strip, that Strip's function and Swap keys operate on *all* Strips currently mapped to the console. This mode is for changing the display only. For example, when setting EQ on a Strip, the other displayed EQ filters on other Strips are not changed.

To activate **All** mode:

1. Hold down the **Wave** key and press the **Clear** key at the top of the Strip (above the top knob's display).

   All appears above **Clear**.
2. Press any function key (i.e., EQ, Dyn, etc.) on that Strip and all knobsets on the console display that function.
3. Press **Swap** to toggle all Strips between their Main and Swap levels.
4. Hold down the **Wave** key and press the **Clear** key again to disable **All** mode.

8.2.7 All Knobs Key

The **All Knobs** key punches out all functions except faders and their corresponding On/Off switches.

- Press the **All Knobs** key to punch out all knobset parameters and switches on that Strip.
- Press and hold down the **Wave** key, press the **All Knobs** key once, and then release both keys to toggle the **ATO/Manual Glide** status for all knobset functions on the Strip. See Section 13.7.2 - *Knob Glide Modes*.
- Press and hold down the **Wave** key, then press the **All Knobs** key repeatedly to cycle through the automation modes. Release the **All Knobs** key to select the highlighted mode for all knobset functions on that Strip.

8.2.8 Copy and Paste

Settings from one channel may be copied and pasted to others.

To copy the settings:

1. Press and hold the **Wave** key down and press the **Copy** key.

   The Strip dims and the **Copy** key flashes.
2. Press the **Func Select** key (to the left of the * key) to copy the knobset function currently assigned to the knobs to the copy buffer. Other functions can be added to the buffer by pressing their function keys.
3. Press and hold the **Wave** key down and press the **Copy** key to stop it from flashing and exit the mode.

To paste the settings to a new channel:

1. Select the Swap or Main channel within the desired Strip.
2. Press and hold the **Wave** key down and press the **Paste** key on the new channel.

   The buffered information is pasted to the channel on the new Strip.

8.3 Channel Process Order and Patch Points

The seven process functions can be placed in any order to suit different applications. The default order is Delay, Metering, Insert, EQ, Filters, Dynamics, and Fader. The nine patch points are A Input, B Input, Insert Send/Return, Pre-fader Output, Post-fader Direct Output, Dynamics Key Input, and Dynamics Side-Chain Link In/Out (see Figure 8-8). All patching can be done from PatchNet (see Chapter 4: *eMix Application*). The A, B, and Key channel inputs can be assigned from the Strip.

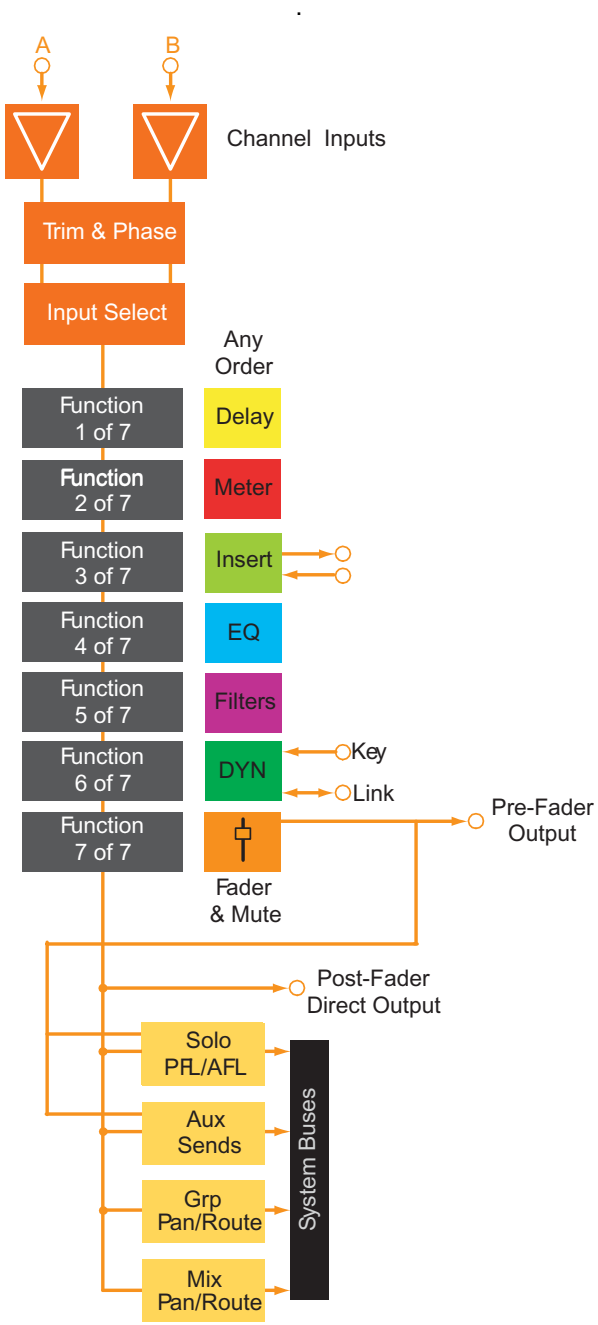


Figure 8-8 Channel processor order and patch points

To display the configuration controls for processor order and patch points:

1. Press the **Input** function key to assign the Input controls to the knobs.
2. Press both **cfg** ◀▶ keys simultaneously to display the configuration pages for patching and processor order on the knobset.

   The **cfg** keys flash in configuration mode.
3. Use the ◀▶ keys individually to display the two configuration pages.

8.3.1 Channel Patch Points

The first configuration page allows sources to be assigned to the Key, A, and B inputs. Each input has identical controls.

All patch points can be set in PatchNet (see *Console I/O* on page 46).

To change the source to the A input:

1. Press the **A Input** knob switch.

   A scrolling list appears on the TFT display above the Strip.
2. Use the switches to the left of the knob to display other groups of sources. These switches function as page up/down keys in this mode.

   Each group is an internal digital or MADI connection that can contain up to 56 audio sources. For example, one group could be mic inputs, another inputs from a digital multitrack machine.
3. When the desired group is located, use the knob to scroll the list to highlight the correct input.
4. Press the knob switch to select that input.
5. Exit configuration mode by pressing both **cfg** ◀▶ keys simultaneously (they stop flashing).

8.3.2 Channel Processor Order

Enter the configuration mode as described in Section 8.3 on page 108. Press the **cfg ▶** key to display the processor order page. The current order is indicated by the knob display (top = first). To change the order:

1. Press the knob switch for the processor to re-order.

   The knob LED flashes and the processor order is displayed on the TFT screen above the Strip. The fader, which becomes the controller to select the order, jumps to a position that reflects the current order.

2. Move the fader up/down to select that processor's new position.

   The screen changes to reflect the new order.

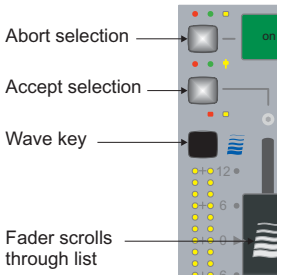


Figure 8-9 Changing processor order

3. When that processor's position is correct, press the fader **Select/Punch** key (above the **Wave** key) to accept the new order.

   The knob display changes only after pressing the **Select/Punch** key.

   Press the switch next to the **Channel On** key to abort the selection.

8.3.3 Insert Point

Each channel can have an insert point with a send and return that can be patched with PatchNet. The insert point can be anywhere among the six processors (Delay, Metering, EQ, Filters, Dynamics, and Fader) and can be considered as another processor.

The insert point can be switched in/out using the **Ins In** key next to the Strip's function keys or from the third Input knobset page.

8.4 Channel Processing Functions

System 5 provides flexible and complete programmable functions for each channel: Input, Dynamics, EQ, Filters, Aux Sends, and Panning.

8.4.1 Inputs

Each channel has an A and B input. See Section 8.3.1 on page 109 to learn about assigning sources for these inputs. The **Inpt** knob (bottom) can feed A, B, or A+B to the channel. These two inputs can be used in many ways but a common application is one Mic and one Line. Another common use is for monitor inputs: Channel 1A is from the Group 1 Bus output while 1B is from the recorder's track 1 output. The A/B source switch then acts as a bus/tape switch.

Press the **Input** function key to display the input controls on the knobset (Figure 8-10). Press the ▶ key to display the B input page with the same controls as the A input. Press the ▶ key again to display the Signal Processing In/Out page.

Atrm and **Aphs** have corresponding controls for the B input; **Dly** and **Inp** adjust one parameter that applies to both inputs.

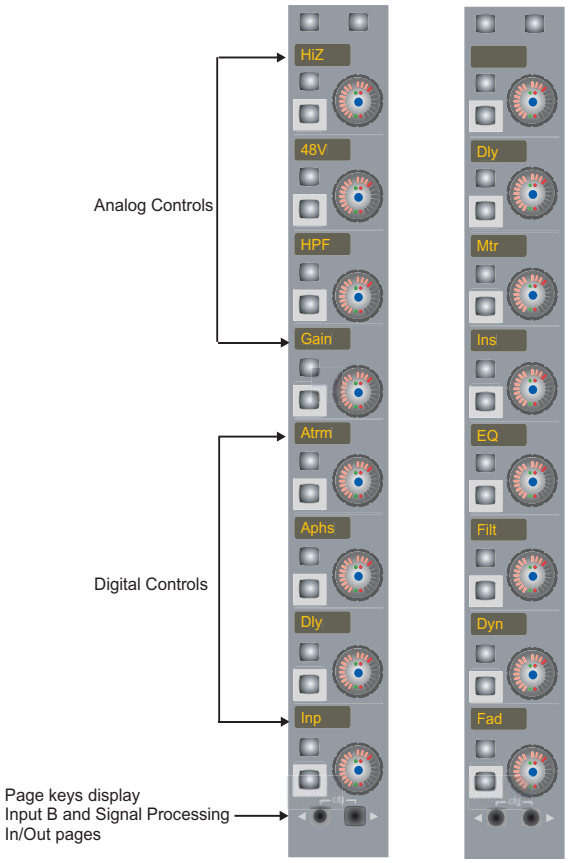


Figure 8-10 Input A (left) and Signal Processing In/Out (right) knobsets

Analog Controls

If an ML530 Mic/Line Interface is patched to the input, the top four knobs show the analog mic/line controls:

- The top knob display shows whether the input is high or low impedance (HiZ = line; LowZ = mic). Press the lower switch to the left of the knob to toggle between values.
- The second knob display shows whether the 48 V phantom power is on/off. Press the lower switch to the left of the knob to toggle phantom power on/off.
- The third knob display shows whether the high-pass filter is on/off. Press the lower switch to the left of the knob to toggle the HPF on/off.
- The fourth knob controls the analog input gain. Spin the knob to adjust the gain between -12 and +72 dB.

NOTE: *If an ML530 Mic/Line Interface is not patched to the input, the top four knobs are blank.*

Digital Controls

The bottom four knobs control the digital parameters of the A and B inputs:

- The **Atrm** knob adjusts the digital trim ±15 dB.
- **Aphs** controls the phase of the A input. Press the lower switch to the left of the knob to toggle the phase. The switch lights to indicate phase reversal. Phase reversal is indicated on the TFT screen above the Strip.
- **Dly** controls the delay for both inputs. Press the lower switch to the left of the knob to enable the delay. The switch lights to indicate the delay is active. Then rotate the knob to adjust the delay in the range 0–2160 samples.
- The **Inpt** knob selects between A, B, and A+B. The selection is indicated on the TFT screen above the Strip.

Stereo Controls

There are two additional controls used for stereo channels (see *Multi Format Masters* on page 132).

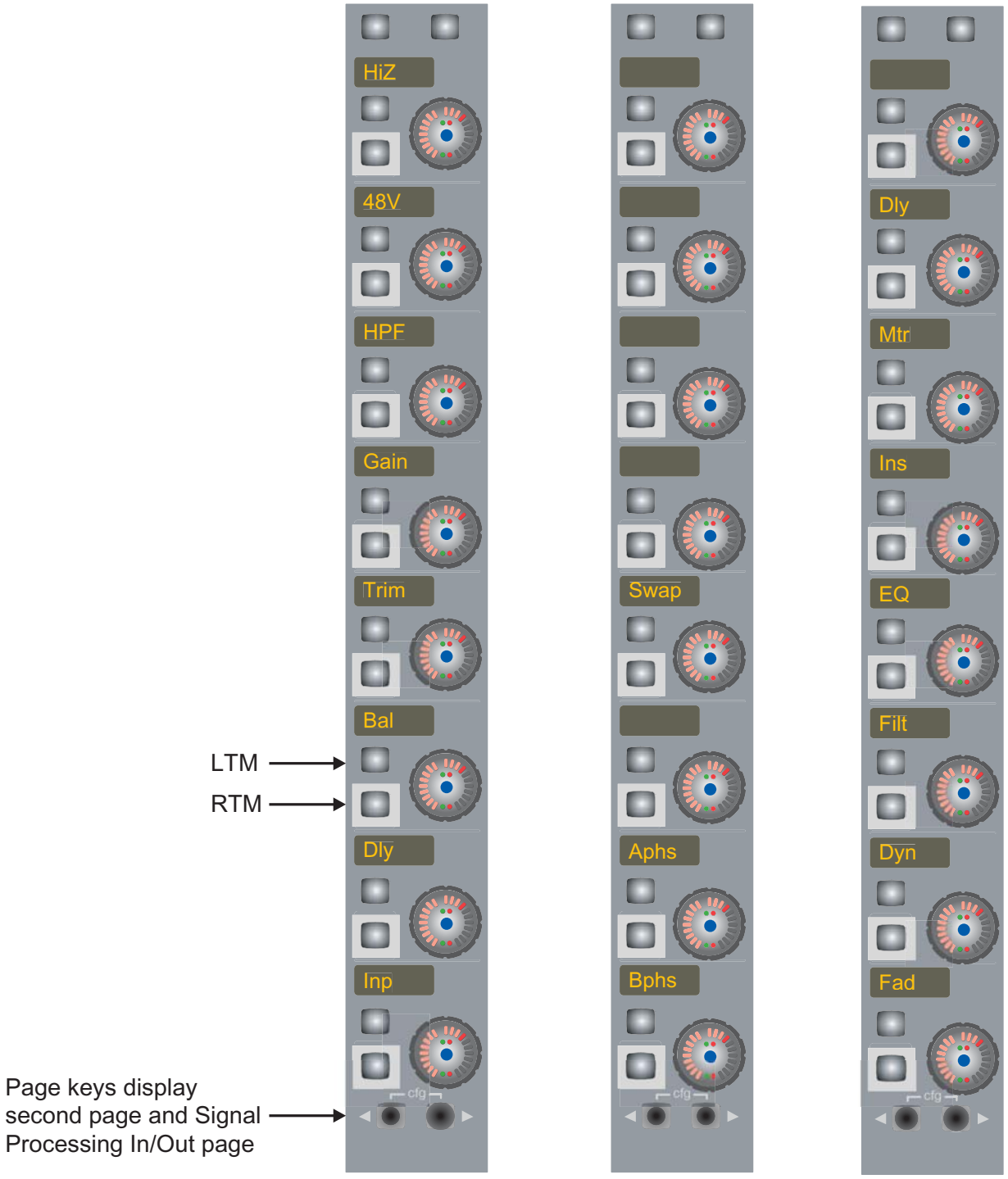


Figure 8-11 Stereo Controls

- **Balance:** Rotate the **Bal** knob left to hear more of the left channel; rotate right to hear more of their right channel. Rotate left or right until the display reads 100L or 100R to hear only the left or right channel.

  Left-to-mono: Press the upper key next to the **Bal** knob to send the left channel equally to both the left and right sides of the stereo channel.

  Right-to-mono: Press the lower key next to the **Bal** knob to send the right channel equally to both the left and right sides of the stereo channel.

  Both-to-mono: Press both keys next to the **Bal** knob to send a mono mix of both channels equally to both sides of the stereo channel. The **Bal** knob then adjusts the mix between left and right channels.

- **Swap:** Press the lower key to reverse the left and right channels.

Signal Processing In/Out

Press the ▶ key (once from the B Input page, twice from the A Input page) to display the Signal Processing In/Out page. The four lower knobs show the four processors; the signal path is from top to bottom. Press the lower button to the left of the knob to toggle the In/Out status of that processor; the switch lights when the processor is *in*.

NOTE: *The function In/Out switches to the left of the Strip's function switches also toggle the processors In/Out.*

See Section 8.3.2 on page 110 to learn how to change the processor order.

8.4.2 Dynamics

Each channel has a compressor/expander/gate with external key input and filtered sidechain. Press the **Dyn** function key to assign Dynamics to the knobset; the TFT display at the top of the Strip shows the dynamics graph (yellow when dynamics are *In*, gray when bypassed). The red dot is a *GainBall* that shows the signal's current gain (y-axis) and the attack and release times as the ball rides up and down the curve.

The entire Dynamics section may be switched in/out with the **Dyn In** key to the left of the Strip's function keys. The Expander/Gate and Compressor can be switched in/out individually on their respective knobset configuration pages. Use the knob to adjust the parameters. Each section discusses the effect, if any, of the switches.

The first Dynamics page (Figure 8-12) shows the main controls for *both* the compressor and expander/gate. Press the ▶ key to display pages with the complete parameters for Expander/Gate, Compressor, and Sidechain/filters.

See Section 8.3.1 - *Channel Patch Points* to see how to patch the sidechain, which can be sent to any source. Patching the sidechain can also be done in PatchNet.

Compressor/Expander (Page 1)

The knobs have four compressor and four expander parameters (Figure 8-12). The knobs with two parameters listed (i.e., **cThr/cKne**) toggle between parameters by pressing the upper switch to the left of the knob.

The lower switch next to the **cRat** knob switches the compressor in/out. The lower switch next to the **xRat** knob switches the expander in/out.

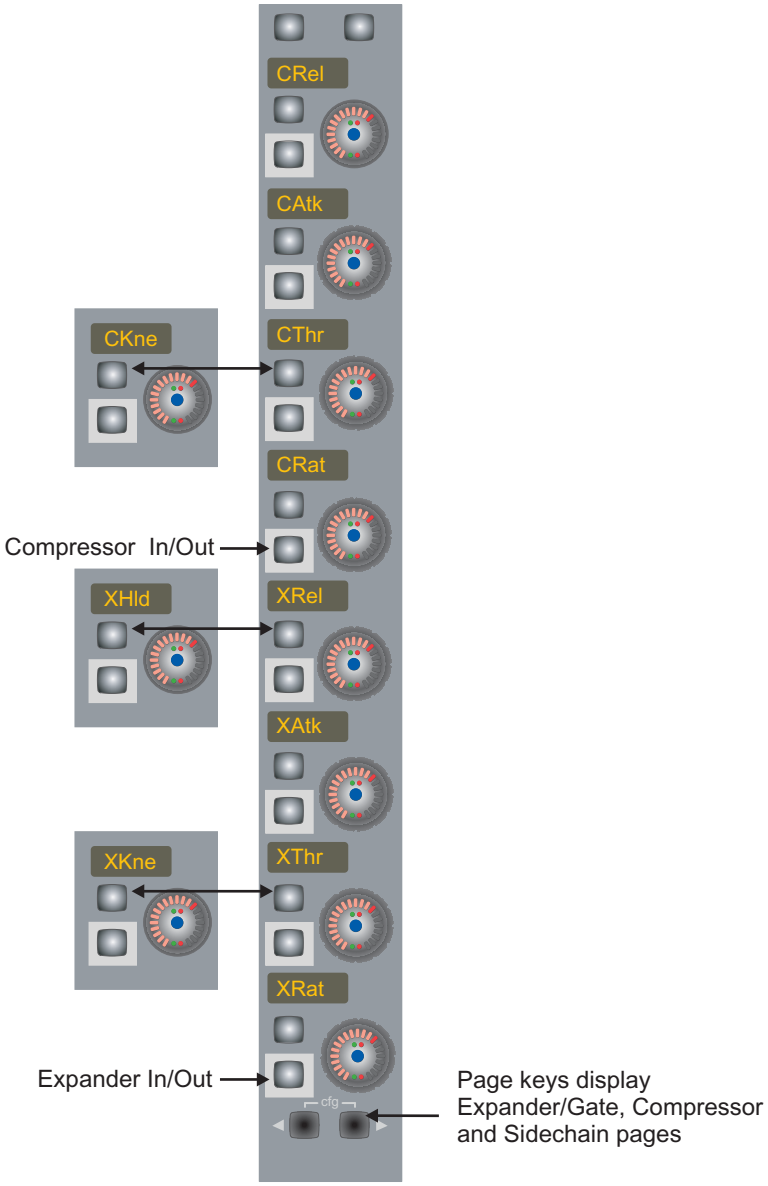


Figure 8-12 Dynamics knobset page 1

Expander/Gate (Page 2)

The expander parameters are shown in Figure 8-13.

xHys: Hysteresis (dB) sets the level that the gain of the expander must fall below to turn off. This prevents the expander from turning on and off if the level hovers around the threshold.

xKne: knee (0–30)

xRat: ratio (infinity:1 = gate)

The lower switch next to the **xRat** knob switches the expander in/out.

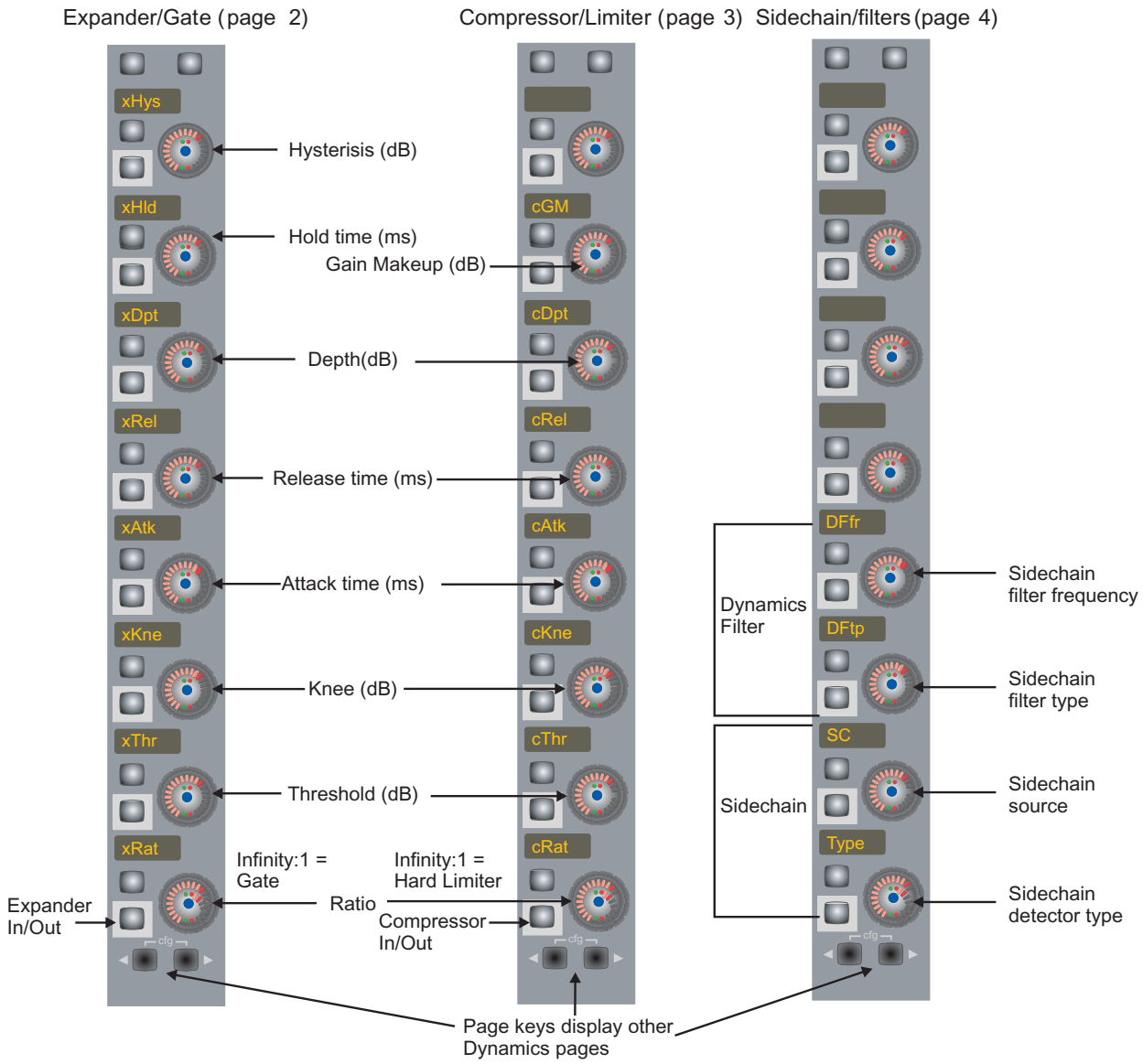


Figure 8-13 Expander/Gate, Compressor, and Sidechain/filters knobset pages

Compressor (Page 3)

The compressor parameters are shown in Figure 8-13.

cGM: gain makeup (dB)
cKne: knee (0–30)
cRat: ratio (infinity:1 = hard limiter)

The lower switch next to the **cRat** knob switches the compressor in/out.

Sidechain/Filters (Page 4)

The Sidechain/Filters knobset page is shown in Figure 8-13.

DFfr: Dynamics Filter; sidechain filter frequency (range = 20 Hz to 21 kHz)
DFtp: Dynamics Filter; sidechain filter type:
(HPF, LPF, BPF, NTCH, OFF-default)
SC: sidechain source (channel, key, link)
Type: sidechain detector type (peak, average for meter display)

The lower switch next to the **SC** knob activates sidechain listen mode for that channel.

8.4.3 Equalizers and Filters

Each channel has a four-band, parametric equalizer and two filters. Press the EQ function switch to display the EQ controls on the knobset. Press the ▶ key to display the Filters page (Figure 8-14).

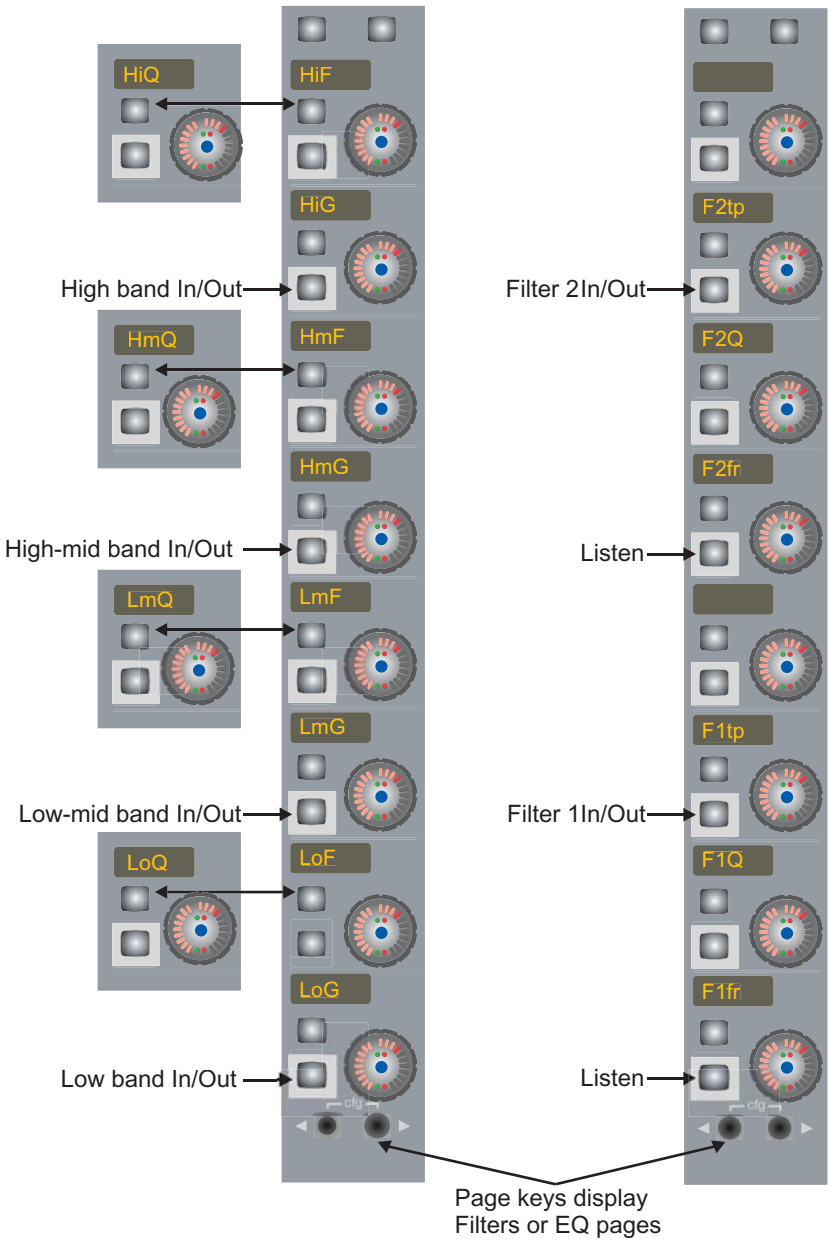


Figure 8-14 EQ and Filters knobsets

Parametric EQ

Each parametric EQ band has two knobs: one shared between frequency and Q and another for gain. Press the upper switch to the left of any of the frequency knobs to toggle between Q and frequency. Use the gain knob to adjust the gain for that band. The lower switch to the left of the gain knob switches that band In/Out.

The four bands are identical (20.5 Hz – 21 kHz) except the HiF and LoF bands can be either peak or shelf filters. Press the lower of the switches to the left of the HiF or LoF knob to toggle between peak (switch lights green) and shelf (no light). Note that this switch indication is present only when displaying frequency on this knob, not Q.

The gain can be adjusted in approximately 1/8 dB increments in the range -24 to +24 dB. As the gain is changed from 0, the LEDs light dimly from the center LED in the direction turned (clockwise = boost); the level is indicated by a bright LED. The LEDs light for every change of 2 dB.

Q can be adjusted in the range 0.2–12 (higher number corresponds to narrower bandwidth). At a given Q setting, changing the gain affects the bandwidth slightly: the bandwidth decreases as gain increases. This creates a wider area of boost/cut at low gain and allows a more natural sound as gain changes without altering the Q. At full boost or cut, the bandwidth is measured 3 dB down from the center frequency.

NOTE: *You can use the EQ graph on the TFT display to create a filter in any desired bandwidth.*

Since Q and Frequency share the same knob, both parameters are indicated on the knob LEDs: Frequency is indicated by a dim LED at its proportional position from first to last LED. For example, 10 kHz would be approximately in the middle. Q is indicated by bright LEDs extending to either side of the frequency LED.

NOTE: *These LED indicators are for fast reference use only; consult the LCD and TFT displays for accurate values.*

The TFT screen above the Strip shows the resultant EQ curve (yellow when active, gray when bypassed).

Filters

Two filters are available on each channel. Each filter can be one of four filter types: high-pass filter (HPF), low-pass filter (LPF), band-pass filter (BPF), and notch filter (NTCH). The knobs are used to control the two filters that can be active at one time. The displays are F2tp (filter 2 type), F2Q(filter 2 Q), F2fr (filter 2 frequency), F1tp (filter 1 type), F1Q(filter 1 Q) and F1fr (filter 1 frequency). Select a filter type by rotating the knob. Disable the filter by selecting **OFF**. Rotate the frequency knob to select the filter frequency. Rotate the Q knob to change Q for a notch filter or bandwidth for a band-pass filter. Each filter can be switched In/Out separately. The filters are not attached to the EQ.

See Section 8.3.2 on page 110 to learn how to change the EQ's signal path order.

Filter Q is variable from 0.2 to 12.

To help find problematic frequencies, the Notch filter can be put into a listen mode which temporarily changes the filter to band-pass by pressing the **Listen** key next to the frequency knob. The listen setting is not saved in the Title and is not automated. Listen defaults to Off.

8.4.4 Aux Sends

The number of Aux sends available depends on the number of cards in the DF64 and the current Mixer Model. See *Mixer Model* on page 56 to learn about these issues.

The CM401 Master module has a Group/Aux Strip used for Aux Master functions. See Section 7.2 - *Bus Master Functions* for general information and Section 7.2.5 - *Group and Aux Busses* to learn how to set up mono and stereo Aux busses.

Aux Sends can be mono or stereo odd/even pairs (i.e., 1/2 not 2/3). Each Aux Send can be configured as pre- or post-fader from the Aux Send Config page (Figure 8-15).

Aux Send Knobsets

Figure 8-15 shows the first eight Aux busses with Aux Sends 1/2 and 7/8 set as stereo pairs and others are mono. Press the ▶ key to display additional busses. Stereo busses use two knobs:

- The Pan knob (top) adjusts the stereo Pan and its lower-left button switches Pan in/out.
- The Gain knob (labeled with the send numbers) adjusts the overall Gain for both sends and its lower-left button switches the pair in/out.

Mono busses use one Gain knob and its lower-left button switches the send in/out.

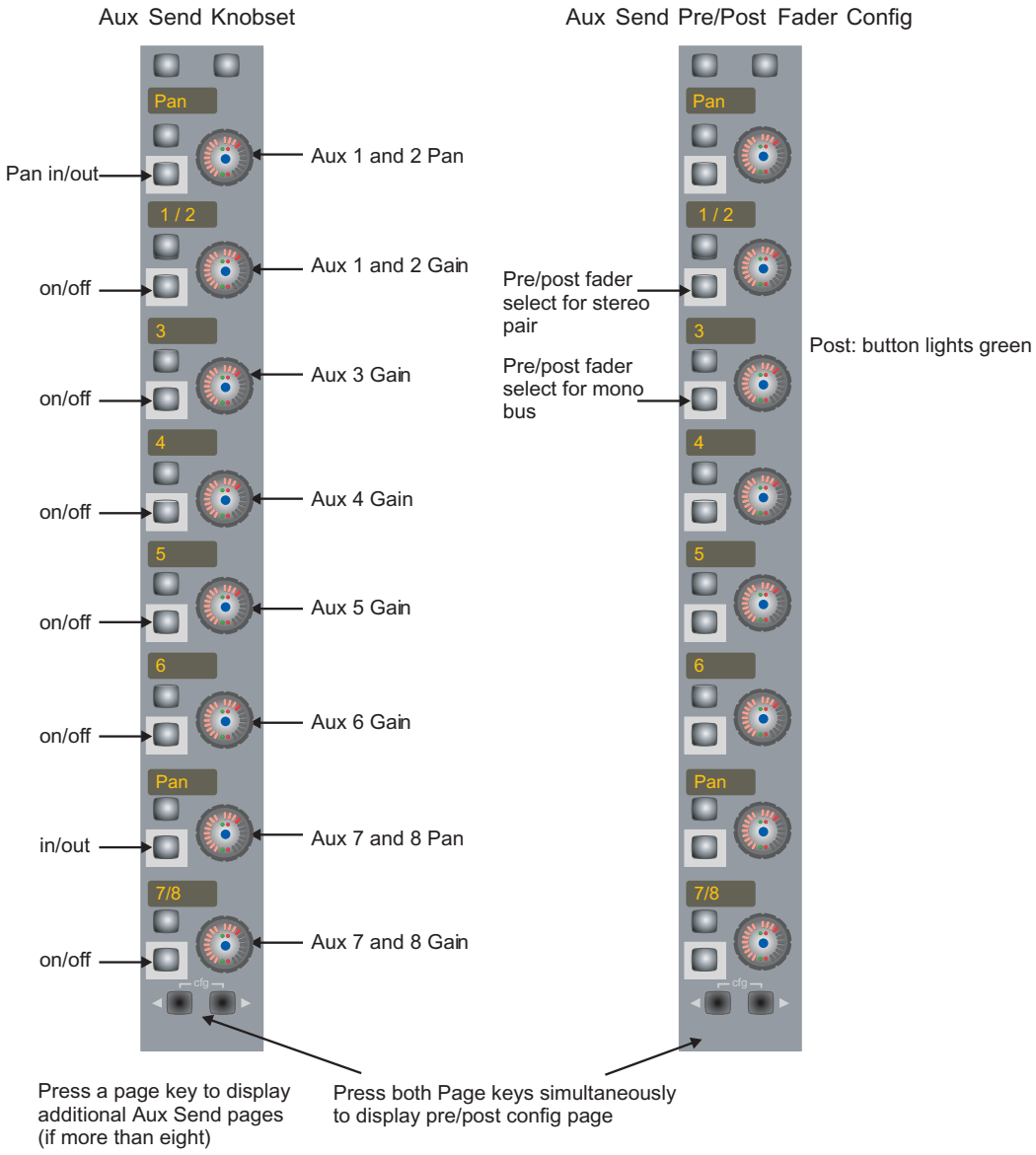


Figure 8-15 Aux Send Knobset and pre/post config pages

Aux Send Config

Aux Sends may be individually set to pre- or post-fader or can be easily set globally.

To set each Aux Bus individually:

1. Press the **Aux** function key to display the Aux Bus knobset.
2. Press both **cfg** ◀▶ keys simultaneously to display the Pre/Post Fader Config page.

   The keys flash to indicate config mode.
3. Press the lower-left button beside each Gain knob to toggle the pre- or post-fader status for that send (or pair for stereo).

   The button lights green to indicate post-fader and does not light for pre-fader. All Aux busses are set to post-fader by default.

To set multiple Aux sends to receive their channels pre- or post-fader:

1. Hold down a Strip's **Wave** key and press the **Clear** key at the top of that Strip (above the top knob's display) to activate **All** mode.

   All appears above **Clear**.
2. Press the **Aux** function key on that Strip to display Aux on all knobsets.
3. Press both **cfg** ◀▶ keys simultaneously on that Strip.

   The Pre/Post Fader Config page is displayed on all knobsets. The **cfg** ◀▶ keys flash to indicate config mode.
4. Press the pre/post keys (lower-left button) for each Aux send you wish to set.
5. Repeat for each channel

Another option is to copy/paste to other channels. After setting one channel to the desired pre/post status for each Aux Send in Step 4 above:

1. Press and hold down the **Wave** key and press the ◀ **Copy** key on the channel just set.

   The channel dims to show it awaits selection of items to copy.
2. Press the Strip's **Aux** switch to select all Aux parameters (pre/post, levels, and on/off states).
3. On the channel you wish to paste to, press and hold down the **Wave** key and press the **Paste** ▶ key.

   After the first paste, the copied channel undims but you can continue pasting to other channels.

8.4.5 Pan

System 5 is not limited to a single pan format and one pan control per channel imposed by the traditional analog console. System 5 allows the following pan formats (also called *pan laws*): mono, stereo, LCR, LCRS, 5.1, 6.1, and 7.1.

A single panner can control several different Mix or Group busses at once, each with different formats. See Section 7.3 - *Mix and Group Bus Setup* to learn how to assign Mix and Group Bus formats.

Pan Knobsets

Press the **Pan** function key to assign the Pan parameters to the knobset (Figure 8-16). See Section 8.5.1 - *Group Bus Routing* and/or Section 8.5.2 - *Mix Bus Routing* to review how to use the **Pan to:** switch to insert Pan.

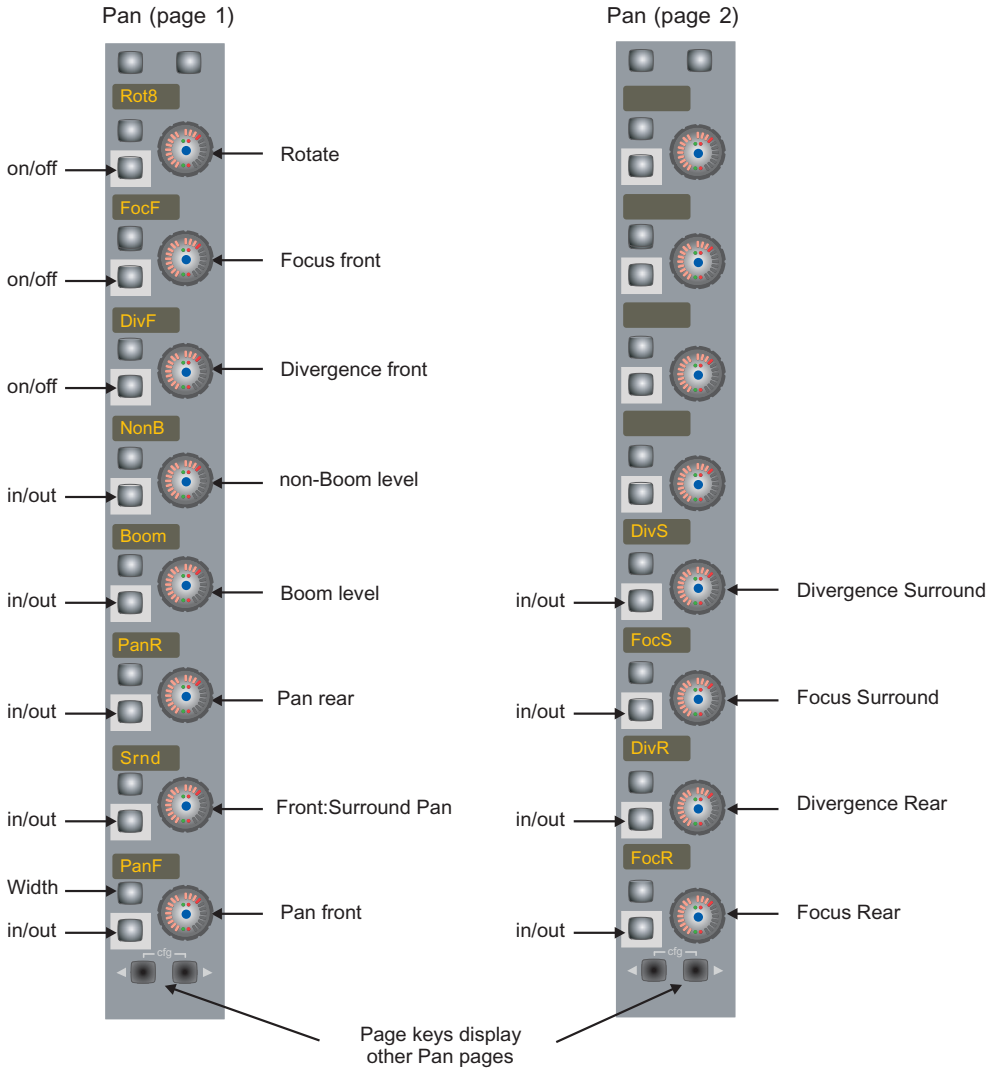


Figure 8-16 Pan Knobsets

Page 1

Rotate (Rot8): Allows circular panning.

Focus Front (FocF): This parameter requires at least three speakers to function. Focus ranges from 0–100%. At 100%, the signal has a pinpoint image: as the signal is panned, it crossfades directly from one channel to the next, completely fading from the first *before* entering the third. As Focus decreases, the signal blurs across multiple channels: the signal moves from channel one into two, and then begins crossfading into channel three before channel one has completely faded out. This results in smoother, dynamically panned objects across the sound field.

0% Focus eliminates the center channel from the pan range entirely. The pan control still functions, although the signal crossfades directly from bus one to bus three. One use of 0% Focus is to create phantom-centered images, where the signal is sourced equally from the left and right front speakers instead of directly from the center speaker.

Divergence Front (DivF): This parameter requires at least three speakers to function. Divergence ranges from 0–100%. At 100%, panning works as expected: Panned to maximum left, there is no signal present in the right or center channels; at the center position, no signal is present in the left or right channel, etc. As the Divergence is decreased, the degree of panning is decreased: The signal level increases in channels that previously had no signal and the difference in signal level between channels decreases.

The purpose of Divergence is to allow someone listening on the extreme left or right to hear a sound panned fully to the other side. For example, at 50% Divergence, a sound panned fully left will retain approximately half its signal level in the right channel compared to the left.

Non-Boom Level (nonB): The level to all channels except the Boom channel. For example, in 5.1-channel format, the Non-Boom level applies to L, C, R, Ls, Rs.

Boom Level (Boom): The level to *only* the Boom channel. For example, in 5.1-channel format, the Boom level applies to only the subwoofer channel.

Pan Rear (PanR): Same as PanF for rear speakers.

Front:Surround Pan (Srnd): Controls the front-to-surround levels without changing the individual front or surround pan settings.

Pan Front (PanF): Controls the front channel levels only (i.e., in 5.1-channel format, pan applies to L, C, R).

Page 2

Divergence Surround (DivS): Same as Divergence Front.

Focus Surround (FocS): Same as Focus Front.

Divergence Rear (DivR): Same as Divergence Front.

Focus Rear (FocR): Same as Focus Front.

Pan Graph

When the Pan parameters are on the knobset, a pan graph appears on the TFT screen showing the two-dimensional position (front:surround and left:right) for that channel.

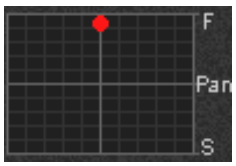


Figure 8-17 Pan graph

SmartPan

The System 5 panner has an automatic function called *SmartPan* that prevents the disappearance of the audio signal during panning if some of that Mix Section's busses are not assigned. For example, if a channel is assigned to a 5.1 Mix Section output but does not send anything to the center mix bus, SmartPan automatically uses a stereo pan law so the signal is still present when panned to the center. SmartPan is always on and cannot be dissabled by the user.

Track Panner Module

The Track Panner Module is a four-Strip wide optional addition to the System 5 console. It controls the Pan of a channel, Multi Format Master, or Control Group assigned to the Center Strip. Press a Strip's **Wave** key to assign it to the Center Strip; the active channel's Pan is automatically controlled by the Track Panner Module.

The switch to the lower left of the trackball is the **Select/Punch** key for the trackball panner. The switch to the lower right of the trackball provides the same function as the Pan function key on the assigned channel: the Pan parameters are assigned to the knobset and the Pan graph appears in the TFT display.

See *Joystick Module* on page 214 to learn more about the CM403's joystick functions.

8.5 Channel Mixing Functions

The number of Group or Mix busses available depends on the number of cards in the DF64 and the current Mixer Model. See *Mixer Model* on page 56 to learn more.

8.5.1 Group Bus Routing

System 5's group busses route signals to multitracks, DAWs, and sub-groups. The center section (CM401) has a mix/group/aux master Strip that controls the master Group functions (see Chapter 7: *Busses and Bus Masters*).

Route a Channel to a Group Bus

To route the post-fader channel signal to a group bus, press the **GRP route** key below the function switches (Figure 8-18). This assigns the Group routing parameters to the knobset. Two Group busses are displayed per knob (i.e., 1/2, 3/4, etc.). Since the display shows only four characters, Group 11/12 is displayed as 11/2.

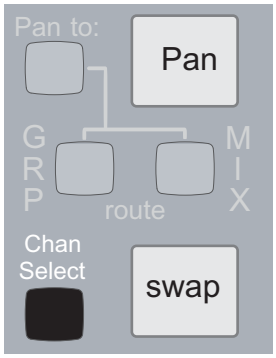


Figure 8-18 GRP and MIX route switches

The upper switch to the left of each knob assigns the first of the two Groups in the display, the lower switch assigns the second (i.e., for 1/2, upper switch assigns 1, lower assigns 2). Group busses can be assigned in pairs from the switch in the center of the knob. The keys light to indicate this channel is assigned to that Group Bus.

Press the **Pan to:** key to switch Pan in/out for the Group Buss. This key is active only when accessing the Mix or Group Bus routing pages. The key lights dimly in other modes to show that Pan is active in Mix and/or Group Bus routing. The **GRP route** key also lights dimly in other modes to show that channel is assigned to one or more Group Busses.

Press the ▶ key to display additional Group Routing pages (if there are more than 16 Group busses in this configuration) or the last page, which has the **GSL** (Group Send Level) controls on the bottom knob. The upper switch to the left of the **GSL** knob is the **Select/Punch** key allowing all Group busses to be selected or punched in at once. The lower switch to the left of the **GSL** knob is the **Group Send** on/off key. The knob adjusts the master level for all Group busses.

8.5.2 Mix Bus Routing

There are 16 Mix Bus sections comprised of individual busses in a defined pan format. For example, one section with an LCRS format uses four busses, another section with a 5.1 format uses six busses. A system with 16 mix busses could have eight sections each with a stereo format.

Route a Channel to a Mix Section

To route the post-fader channel signal to a Mix bus, press the **MIX route** key below the function switches (Figure 8-18). This assigns the first eight Mix sections that have been defined in eMix to the knobset. Press the ▶ key to display additional Mix Routing pages if there are more than eight.

- The upper switch to the left of each knob allows changing the automation mode. Hold the **Wave** key down and press the switch to cycle through the modes.
- The lower switch to the left of the knob assigns that section.
- The knob center switch brings the individual busses of that mix section to the knobset.

Assignments and pan settings are remembered when routing is toggled off and on.

When an individual section is assigned to the knobset, the lower switch to the left of the knob toggles that bus on/off.

Press the **Pan to:** key to switch Pan in/out for the Mix sections. This key is active only when accessing the Mix or Group Bus routing pages. The key lights dimly in other modes to show that Pan is active in Mix and/or Group routing. The **MIX route** key also lights dimly in other modes to show that channel is assigned to one or more busses.

Chapter 9: Control Groups and Multi Format Masters

9.1 Control Groups

System 5 supports ***Control Groups*** which allow a ***Group Master*** channel to control multiple *slave channels*. Control Groups are similar to traditional VCA Groups. The Group Master channel can be assigned to a strip just like any other channel. The most common use of a Control Group is to control similar channels from one strip. For example, a single master fader can be used to change the fader level of all announcer mics. System 5 allows up to 48 Control Groups, each of which can control the following channel settings: Fader, On/Off, Pan, Aux, Filters, EQ, Dynamics and Input.

The relative fader level of each slave channel can be individually set and the master channel preserves these relative fader levels as the master fader is altered. This allows all slave channels to be smoothly faded out by bringing down the master fader. The **Groups Panel** (Figure 9-1) provides the interface to configure the settings. Empty Control Groups are displayed with dim illumination (G5–G24). Press the Page keys to display the two sets of 24 Control Groups.

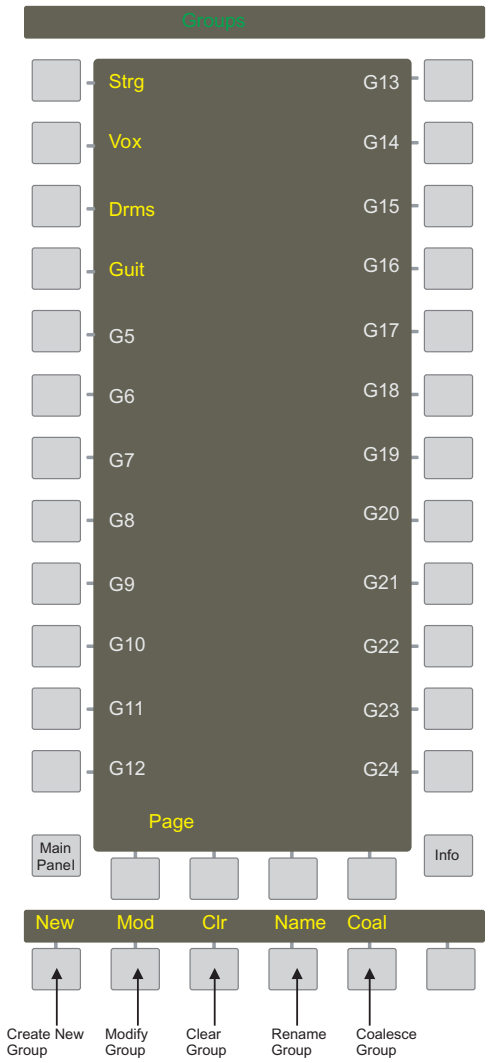


Figure 9-1 Groups Panel

9.1.1 Create Control Group

1. Press the **New** key at the bottom-left of the **Groups Panel** (Figure 9-1).
2. Select the slave channels by pressing their **Chan Select** keys.

   The **Chan Select** keys flash to show they are included in the Control Group. Press the **Chan Select** key again to remove it from the Control Group. The Slave LED lights.
3. Press a Control Group key in the **Groups Panel**.

   The **Name** key flashes to show the Control Group is ready to be named from the keyboard (four characters maximum).

Other Groups can be included as slaves but a slave from another Control Group cannot be included in the new Control Group.

9.1.2 Assign Control Group to Strip

Assigning a Control Group to a Strip is identical to assigning any other channel; Groups appear in the list when assigning a channel (see Section 8.1.1 - *Map Channels and Control Groups to Strips*). The Master LED lights when a Control Group is assigned to a channel.

9.1.3 Modify Control Group

1. Press the **Mod** key at the bottom-left of the **Groups Panel** (Figure 9-1).

   The **Mod** key flashes.

2. Press the Control Group key to be modified.

   The Control Group key flashes to show it is ready to be modified. The **Chan Select** keys flash for all channels assigned to that Control Group. The appropriate Swap/Main must be active to see the **Chan Select** key flash.

3. Press the flashing **Chan Select** keys to delete them from the Control Group and non-flashing **Chan Select** keys to add them.

4. Exit this mode by pressing **Mod** again, another Control Group key, or any key that accesses the Panel Viewer.

9.1.4 Name Control Group

1. Press the **Name** key at the bottom of the **Groups Panel**.

   The **Name** key begins flashing.

2. Press the key for the Control Group you wish to rename.

3. Name the Control Group from the keyboard (maximum four characters).

9.1.5 Clear Control Group

1. Press the **Clr** key at the bottom of the **Groups Panel**.

   The **Clr** key begins flashing.

2. Press the key for the Control Group you wish to clear.

   All slaves are deleted from the Control Group, the name reverts to the default (G#), and the display dims to show it is empty.

9.1.6 Coalesce Control Group

This operation takes automation from the Control Group master and transfers it to the slaves. The audio result is identical to before the coalesce; the Control Group remains intact.

1. Press the **Coal** key at the bottom of the **Groups Panel**.

   The **Coal** key begins flashing.

2. Press the key for the Control Group you wish to coalesce.

9.2 Multi Format Masters

A ***Multi Format Master*** allows stereo, LCRS, 5.1, 6.1, and 7.1 channels to be built from mono channels. The Multi Format Master channel can be assigned to a Strip just like a normal channel. There can be up to 48 Multi Format Master channels.

The most common use of Multi Format Masters is to implement stereo channels. Stereo channels have the following additional controls: **Balance**, **LTM** (Left to Mono), **RTM** (Right to Mono), **Left/Right Swap**. A *both-to-mono* function is available by pressing both the **RTM** and **LTM** keys. For more information, see *Stereo Controls* on page 113.

A Multi Format master channel must be set up first in PatchNet:

1. Click the **Masters** tab at the bottom of the window.

Figure 9-2 Masters Screen

2. Select the channels to include in the master channel by left-clicking and dragging across the desired channels.

   The selected channels are now highlighted.

3. Right-click on any highlighted channel to select their channel format.

   To group discontinuous channels into a multi-format master, right-click each channel and select the same format.

In PatchNet, the dynamics automatically link stereo, LCRS, 5.1, 6.1, or 7.1 channels.

Place the master on a channel strip like a normal channel:

1. Press the **Masters** key from the **Main Panel**.
2. Select a master channel and assign it to a Strip.

All Multi Format channels have a pan width control activated by the upper switch to the left of the **PanF** knob. Multi Format masters can be automated just like a mono channel.

9.3 Spill Area

The Spill function temporarily assigns the slaves channels of a Control Group or Multi Format Master to predefined Strips. See also *Spill Select* on page 102 for details.

1. Press the **Strips** key in the **Main Panel**.
2. Press the **Spill Select** key in the **Strips Panel**.
3. Press the **Wave** key on each Strip to include in the Spill area.
4. Press the **Chan Select** key on a master to spill its slaves into the selected Spill area.
5. To *unspill* the slave channels from the Spill area and restore the Strip's previous channels, press any master or slave **Chan Select** key.

9.4 Control Groups or Multi Format Masters

This section presents general information to help decide whether to use a Control Group or Multi Format Master for a given task.

If you need to adjust individual parameters on the slave channels, use a Control Group. Multi Format Master channels are set up with all functions on the slave channels switched in. Therefore, adjusting the EQ on the Multi Format Master channel affects all the slave channels. Adjusting parameters on the Control Group Master affects the slave channels only if that function is switched in at the slave when the Control Group was created or subsequently. For example, adjusting EQ on a Control Group master has no effect on the slave channel unless the slave channel's EQ is switched in.

If a VT is playing a stereo format, use a Multi Format Master because they include dedicated stereo functions: LTM, RTM, Balance and Swap (see *Stereo Controls* on page 113).

If the VT is playing dual mono signals (i.e., dialog and music), use a Control Group or just two mono channels because you may want to apply different EQ and compression settings to each signal. Use a Control Group to control multiple mics on a similar source (i.e., crowd or drums).

To summarize:

- True stereo source: Multi Format Master (do not adjust the slave channels)
- Dual mono: Control Group (adjust functions on the slave channels)
- Multiple similar signals: Control Group (adjust functions on the slave channels)

Chapter 10: Layouts and Snapshots

System 5 performs several mix-management functions significantly faster than any pre-digital mixing system:

- The PatchNet digital signal patching system (see Chapter 4: *eMix Application*) can save a complex patch system for each Title.
- Automation (see Chapter 13: *Dynamic Automation*) allows virtually all settings to be recorded, refined, and replayed with unprecedented precision.

Snapshots and **Layouts** further extend this model of flexibility by storing different, but complementary, information that describes the console state at a given time:

- **Layouts** store the channel-to-strip mapping.

  For example, channel 8 is mapped to Strip 3 Main level.
- **Snapshots** store the settings of selected channel functions and settings, even if they are not currently assigned to the console surface.

  For example, a Snapshot that contains Channel 3's **EQ** and **Dynamics** will restore the values to both functions, regardless of the current knobset function.

Snapshots and Layouts naturally complement each other because their information, while related, does not overlap: Layouts map channels to Strips and Snapshots determine all, or part of, their channel settings.

Naming, storing, modifying, and recalling functions are accomplished through the **Snapshot** and **Layout Panels**, accessed from the **Main Panel**.

10.1 Layouts

A system with 24 Strips and 96 channels cannot map all channels to the console surface at once. Since each Strip can have two channels (Main and Swap), two Layouts are required to map all 96 channels:

1. Channels 1–24 to Strips 1–24 Main

   Channels 25–48 to Strips 1–24 Swap

2. Channels 49–72 to Strips 1–24 Main

   Channels 73–96 to Strips 1–24 Swap

A group of channels sharing a common attribute that are normally required on the console at the same time (i.e., drums, vocals, or dialogue) are ideally stored in a Layout.

The **Layouts Panel** provides the interface to name, store, modify, and recall up to 48 channel-to-strip maps.

10.1.1 Create a New Layout

1. From the **Main Panel**, press the **Layout** key to display the **Layout Panel**.

   The button beside the last Layout recalled is illuminated.

2. Press the **New** key at the bottom-left of the **Layout Panel.**

   The key flashes to signify creation of a new Layout.

3. Select the channels to include in the new Layout:

   Press the **ALL** key at the bottom-right of the **Layout Panel** to select all console Strips.

   Or

   Press the **Wave** key for each Strip to include in the Layout.

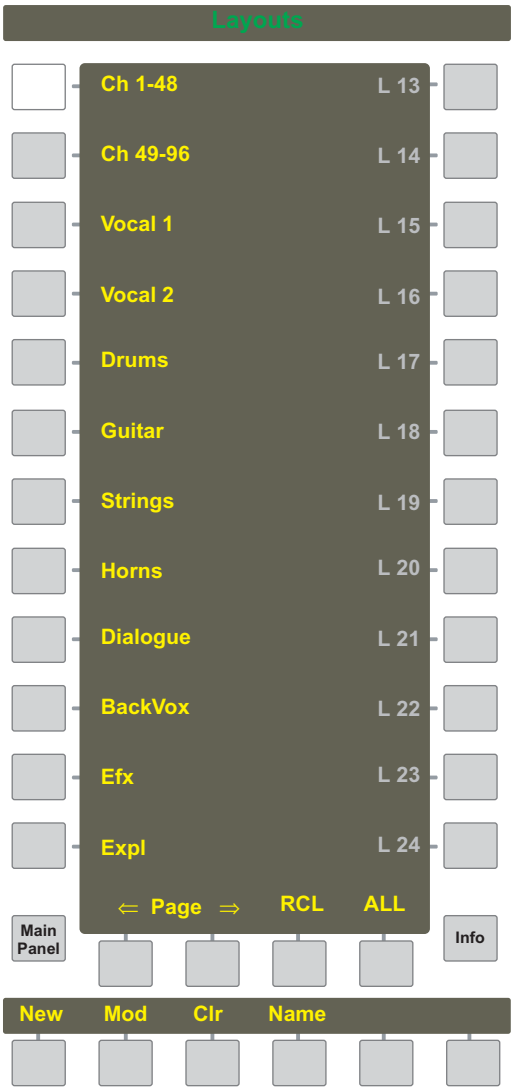


Figure 10-1 Layouts Panel

4. To store the new Layout, press the key corresponding to the layout you wish to save in the **Layout Panel**.

   Unused locations are darkened and have a default name (L #). In Figure 10-1, the first unused location is **L 13**.

   The **New** key darkens and the **Name** key illuminates.

5. Use the console keyboard to name the new Layout.

10.1.2 Recall a Layout

To recall a single Layout:

1. If the **RCL** key is not lit, press it once so it flashes.
2. Press the **location** key for the desired Layout.

   The Layout reconfigures the console surface and the **RCL** key turns off.

It can be useful to recall several Layouts consecutively to decide which to work with:

1. If the **RCL** key is not lit, press it *twice* so it illuminates but does not flash.

   If the **RCL** key is flashing, press it once.
2. Press the **location** key for the desired Layout.

   The Layout reconfigures the console surface and the **RCL** key remains illuminated for another Recall selection.

10.1.3 Modify a Layout

1. Press the **Mod** key at the bottom of the **Layout Panel** so it flashes.
2. Press the key corresponding to the Layout you wish to modify.

   The key begins flashing and the **Wave** keys for Strips in this Layout illuminate.
3. Press an illuminated **Wave** key to exclude a Strip currently in the Layout.
4. Press an unlit **Wave** key to include a new Strip in the Layout.

   The **Wave** key begins flashing.
5. Press the Layout's key again to store changes to this Layout.
6. Press the **Mod** key again to exit the modification process.

10.1.4 Rename a Layout

1. Press the **Name** key at the bottom of the **Layout Panel** so it begins flashing.
2. Press the key corresponding to the Layout to rename; that key also flashes.
3. Use the console keyboard to rename the Layout (eight characters maximum) and press **Enter** to exit the process.

   You can also press the Layout's key or the **Name** key again to store the new name and exit the renaming process.

10.1.5 Delete a Layout

1. Press the **Clr** key at the bottom of the **Layout Panel** so it begins flashing.
2. Press the key corresponding to the Layout to delete.

   That key's display darkens and the name returns to the default (i.e., L #).

10.2 Snapshots

A Snapshot stores selected channel functions, switch states, fader and pan settings, and routings for a selected number of channels. System 5 provides easy methods to store:

- An individual function parameter or switch state;
- The current Knobset function;
- All functions from one or more channels;
- All functions from all channels currently on console surface;
- All functions in all channels in mixer model.

The number of Snapshots that can be stored within System 5's pre-defined memory area depends on the content of each Snapshot. There are 240 storage locations but only a fraction of these can be used in the largest console configuration, with all settings stored for all channels.

10.2.1 Create a New Snapshot

1. From the **Main Panel**, press the **Snapshot** key to display the **Snapshot Panel**.

   The button beside the last Snapshot recalled is illuminated.
2. Press the **New** key at the bottom-left of the **Snapshot Panel.**

   The **New** key flashes to signify creation of a new Snapshot.
3. Select the function(s) to include in the Snapshot using any of the following methods:

   #### *Individual Function or Channel Parameter*

   Press a Strip function's parameter key or switch to select only that parameter (i.e., High EQ, fader on/off, etc.).

   #### *Current Knobset Function*

   Press the **Knobset Select** switch at the top-right of the Strip or the **Func Sel** switch (to the left of the * key) to select all parameters for the current knobset function in the current channel (Main or Swap).

Individual Channels

Press the **Chan Select** key for each channel to include in the Snapshot. All channel settings are included but only for the active layer (Main or Swap).

All Strips on Console Surface

Press the **Strps** key at the bottom of the **Snapshot Panel** to select all Knobset functions and switches for all Strips (both Main and Swap channels) currently on the surface.

Or

All Functions in All Channels in Mixer Model

Press the **ALL** key at the bottom-right of the **Snapshot Panel** to select all Knobset functions in all console channels (Main and Swap for each channel in the Mixer Model). The ALL keys in the automation area perform the same function.

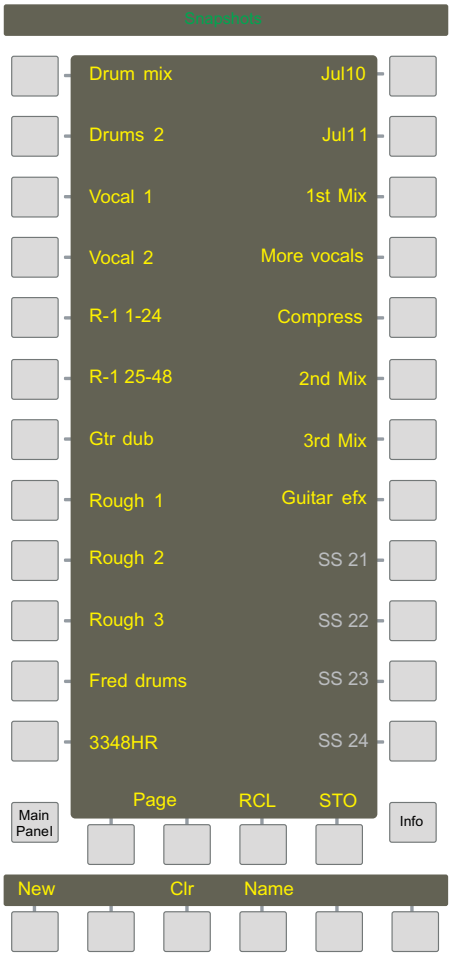


Figure 10-2 Snapshots Panel

4. Press an unused key in the **Snapshot Panel** to store the new Snapshot.

   Unused locations are darkened and have a default name SS #. In Figure 10-2, the first unused location is **SS 20**. *It is not possible to overwrite an existing Snapshot. To reuse an existing location, delete the Snapshot first (page 142).*

   The **New** key darkens and the **Name** key illuminates.

5. Use the console keyboard to name the new Snapshot and press **Enter**.

It is worth mentioning that after a Snapshot is created, there is no method to determine its exact contents. For this reason, we recommend storing complete channels and using a descriptive name. See *Update Snapshot* for information about modifying a Snapshot.

10.2.2 Recall a Snapshot

To recall a single Snapshot:

1. If the **RCL** key is not lit, press it once so it begins flashing.
2. Press the key corresponding to the Snapshot you wish to recall.

   The Snapshot restores the selected settings and the **RCL** key turns off.

It is sometimes useful to recall several Snapshots consecutively to decide which one to work with:

1. If the **RCL** key is not lit, press it *twice* so it illuminates. If the **RCL key** is flashing, press it once.
2. Press the key corresponding to the Snapshot to recall.

   The Snapshot reconfigures the console surface and the **RCL** key remains illuminated for another selection.

10.2.3 Update Snapshot

If function or switch values in a Snapshot change, they can be updated easily.

1. Press the **STO** key at bottom-right of the **Snapshot Panel**.

   The **STO** key begins flashing.

2. Press the key for the Snapshot to update.

   Only the items from the Snapshot are updated to the current settings.

10.2.4 Rename a Snapshot

1. Press the **Name** key at the bottom of the **Snapshot Panel** so it begins flashing.
2. Press the key corresponding to the Snapshot to rename.

   That key flashes.
3. Use the console keyboard to rename the Snapshot (eight characters maximum).
4. Press the **Enter** key on the keyboard, the Snapshot's key, or **Name** key again to store the new name and exit the process.

10.2.5 Delete a Snapshot

1. Press the **Clr** key at the bottom of the **Snapshot Panel** so it begins flashing.
2. Press the key corresponding to the Snapshot to delete.

   That key's display darkens and the name returns to the default (i.e., SS #).

NOTE: *A Snapshot must be deleted before its location can be used again.*

Chapter 11: Machine Control

The Machine Control Panel in the center section contains System 5's Transport and Locate functions.

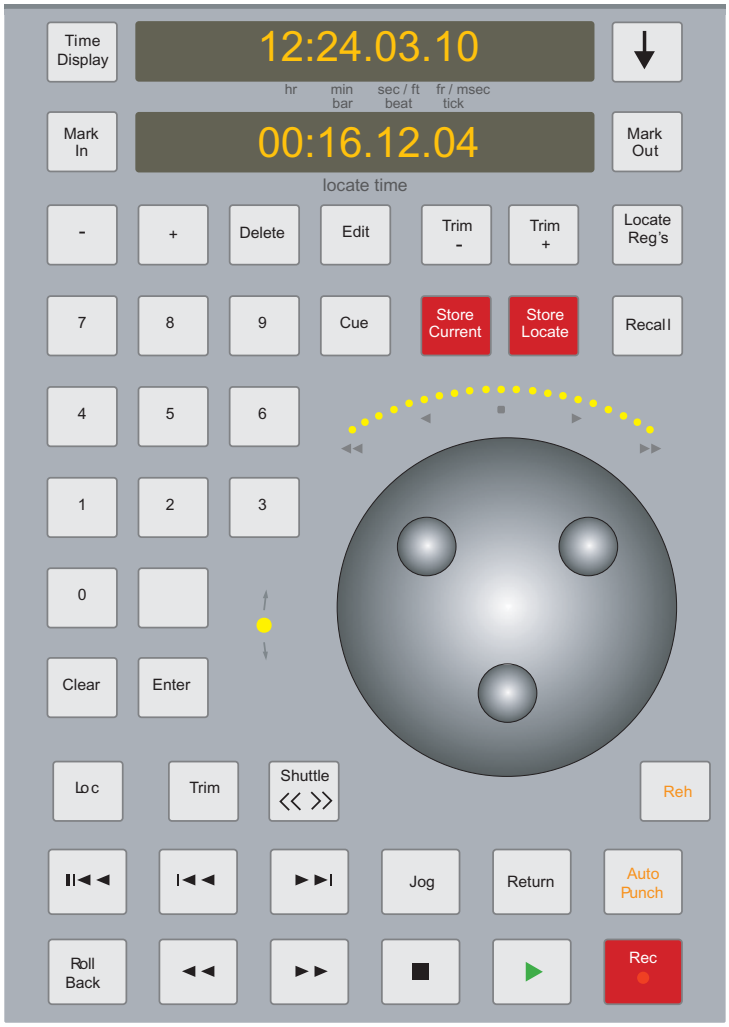


Figure 11-1 Machine Control Panel

11.1 Transport Controls

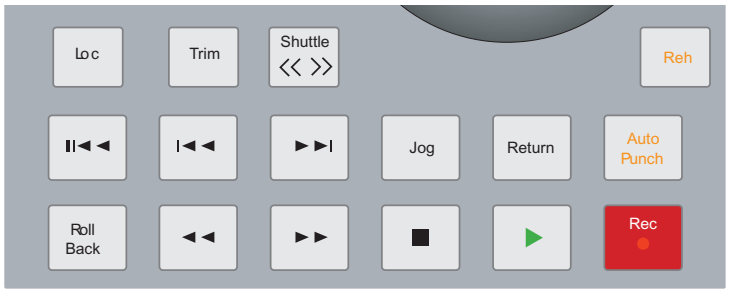


Figure 11-2 Transport Controls

The Transport section has the standard **Play**, **Rewind**, **Fast Forward**, **Stop**, and **Record** keys. The following keys provide additional transport functions:

Press the **Shuttle** key (it lights) to allow the SpinKnob to move the transport backwards or forwards. The speed depends on the degree of the SpinKnob's rotation. Press the **Shuttle** key again to deactivate.

Press the **Jog** key (it lights) to allow the SpinKnob to move the transport backwards or forwards. The speed depends on the degree of the SpinKnob's rotation; maximum rotation moves the transport at the Play speed. This function is helpful for setting precise edit and cue points. Press the **Jog** key again to deactivate.

11.2 Locate Controls

The Locate controls *locate* to a precise location rather than moving continuously like the Transport controls.

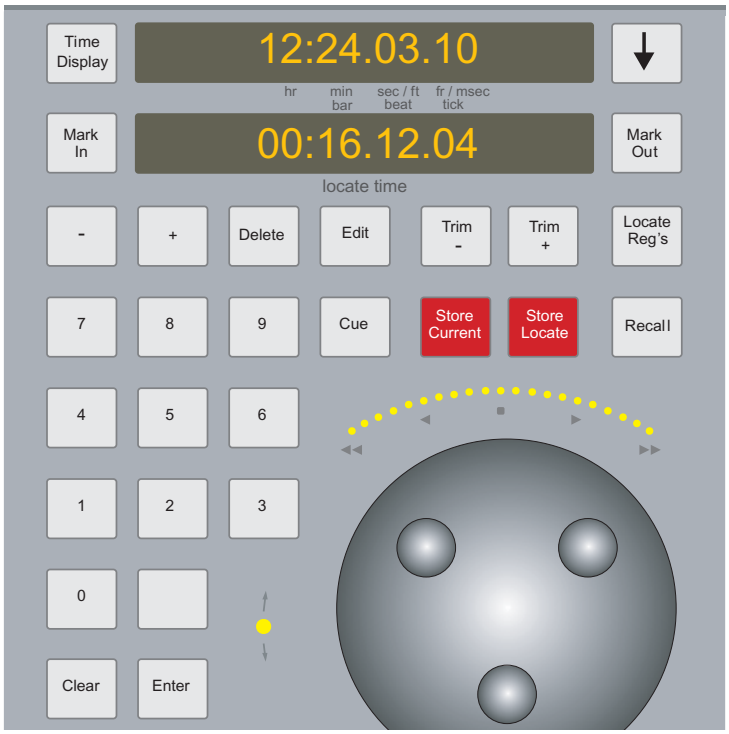


Figure 11-3 Locator Controls

11.2.1 Time Displays

The Current and Locate Time Displays at the top of Figure 11-3 are an integral part of the Locate functions. The Current Time Display (top) shows the absolute time code at the current transport location.

The Locate Time Display (bottom) contains the Locate Time Register value. This value can be stored to any of the registers displayed in the **Locate Registers Panel** (Figure 11-4). Press the **Locate Reg's** key below the Locate Time Display to display the **Locate Registers Panel** in the Panel Viewer.

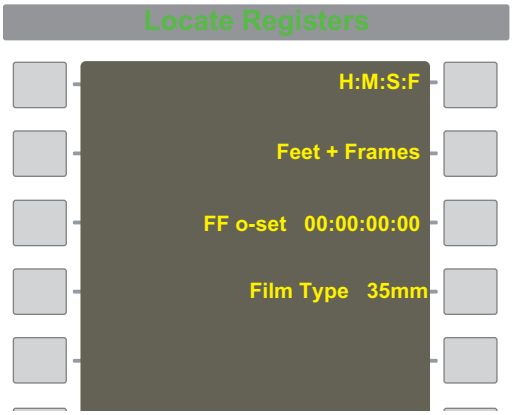


Figure 11-4 Locate Registers Panel

Feet + Frames or H:M:S:F Display

The tape time can be displayed in the **H:M:S:F** format (the default SMPTE timecode) or the **Feet + Frames** format commonly used for film. To choose the format, press the **H:M:S:F** or the **Feet + Frames** key in the **Locate Registers Panel** to activate that display format.

Feet + Frames Offset

The **FF o-set** is applied to incoming timecode only if **Feet + Frames** is active. The timecode is displayed without the offset if the H:M:S:F format is active. To set the **FF o-set** time:

1. Enter a timecode into the **locate time** display using the numeric keypad on the center section **Automation Panel**.

   The entire time must be entered. When the first numeric key is pressed, the display clears to enter the new value.

2. Press **Store Locate** and then the **FF o-set** key in **Locate Registers Panel** to transfer the **locate time** to the **FF o-set** field.

Film Type

The Feet+Frames display can be set to 3 mm, 35 mm 25 Fr, 16 mm, or 16 mm Key (half-feet).

Entering and Modifying Time Displays

There are three ways to enter a time into the Locate Time Display:

- **Numeric Keypad**: Use the numbers along the left of the Machine Control Panel to enter a time. To enter 5 seconds, press **5**, **0**, **0**, **Enter**. It is not necessary to enter leading zeros.
- **Transfer Current Time to Locate Time**: Press the downward arrow to the right of the Current Time Display to transfer it to the Locate Time Display.
- **Recall Key**: Press the **Recall** key (it flashes), then press **Pre-Roll**, **Post-Roll, Rollback**, **T/Start**, **T/End, R/Start** or **R/End** in the Locate Registers Panel to transfer its value to the Locate Time Display.

There are two ways to modify the Locate Time:

- Use the **Trim +** and **Trim -** keys to add or subtract one frame to or from the Locate Time.
- Press the **Trim** key (it flashes) below the **Enter** key to use the SpinKnob to modify the Locate Time. Press the **Trim** key again (to stop flashing) when finished.

11.2.2 Store Locate Value to a Register

Press the **Store Locate** key (it flashes until destination key pressed) followed by the **Pre-Roll**, **Post-Roll, Rollback**, **T/Start**, **T/End, R/Start** or **R/End** keys to store the Locate Time to that register. See page 146 to see how to store to the **FF o-set** key.

11.2.3 Store Current Value to a Register

Press the **Store Current** key (it flashes until destination key pressed) followed by the **Pre-Roll**, **Post-Roll, Rollback**, **T/Start**, **T/End, R/Start** or **R/End** keys to store the Current Time to that register. See page 146 to see how to store to the **FF o-set** key.

Mark In/Mark Out

Press **Mark In** or **Mark Out** to capture the Current Time into the **R/Start** or **R/End** parameters, respectively. Press the **Store Locate** key before pressing **Mark In** or **Mark Out**, to capture the Locate Time instead of the Current Time. Press the **Recall** key and then **Mark In** or **Mark Out** to recall the stored **R/Start** or **R/End** time to the Locate Time display.

11.2.4 Locate Key

Press the **Loc** key to locate the transport to the value in the Locate Time Register.

11.2.5 Return Key

Press the **Return** key to cycle the transport between the **R/Start** and **R/End** locations (pre- or post-roll times are observed).

11.2.6 Title Start

Locates to the **T/Start** (Title Start) time set in the Locate Registers Panel (Figure 11-4).

11.2.7 Cue Points

Each Title can store up to 99 Cue points. To create a new Cue:

1. Press the **Store Locate** or **Store Current** key to use the Locate or Current Time, respectively.
2. Press the **Cue** key (left of **Store Current** key).

   The Cue is placed in the Cue list sorted by increasing timecode values.

Displaying and Using Cue Points

Press the **Cue** key by itself (lights to show it is active) to display the Cue list on the TFT screen above the Master section. Use the SpinKnob to scroll through the list. The Current Cue is highlighted in the list and its value displayed in the Locate Time Display. Press the **Loc** key to locate to that Cue Point. Press the **Cue** key to deactivate it.

NOTE: *If any of the **Store Locate**, **Store Current**, or **Recall** keys are flashing to indicate they are waiting for a destination key to be pressed, pressing the **Cue** key does not display the Cue list.*

Next and Previous Cues

The following keys locate through the Cue List sequentially:

Locates to the previous Cue point.

Locates to the next Cue point.

Editing and Deleting Cue Points

Press the **Edit** key (flashes when active) to edit the Current Cue Point's timecode and name. See *Entering and Modifying Time Displays* on page 147 to see how to enter and modify times.

To edit the name, type the new name and press **Enter** on the Machine Control Panel or the keyboard. Press **Edit** again to exit the mode.

Delete a highlighted Cue by pressing the **Delete** key (next to **Edit**) or on the keyboard.

11.3 Track Arming

Track arming from System 5 is controlled in the **Machine Setup Panel (**Figure 11-5). Press the **Machine Setup** button from the **Main Panel**. The **Record in Motion, Track Arm in Motion, On Transport Stop**, and **Arm While Stopped** each have two, mutually exclusive settings.

A single serial port of the TT007 (v3.0x or newer software) can provide up to 48 channels of track arming. Track arming and record tally information is sent to the console and is used to generate a true track status tally on the surface (top of CM402 and record paddles in CM403):

- flashing = armed
- solid = recording

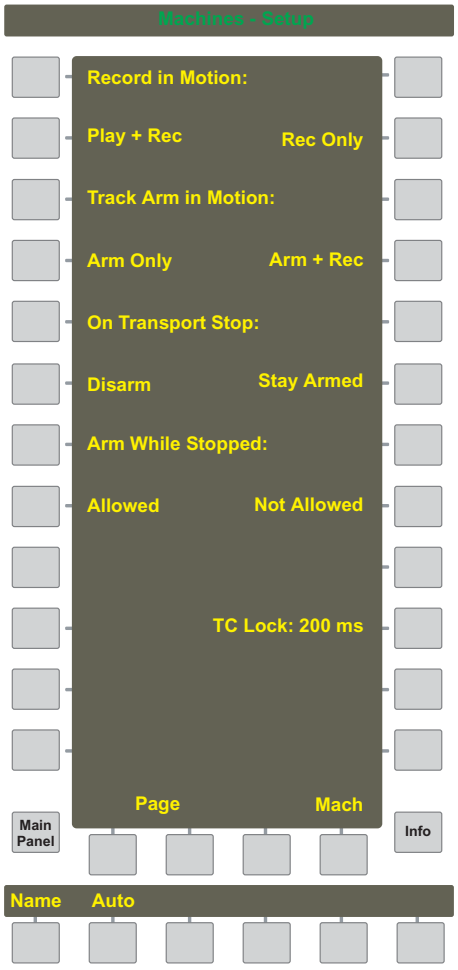


Figure 11-5 Machine Setup Panel

11.3.1 Record in Motion

These controls affect the recorder while the transport is in motion.

- Activate the **Play + Rec** key to place armed tracks into record by pressing the play and record keys together.
- Activate the **Rec Only** key to place armed tracks into record by pressing just the record key.

11.3.2 Track Arm in Motion

These controls determine what happens when a track arm command is sent while the transport is moving.

- Activate the **Arm** key to send only a track arm command.
- Activate the **Arm + Rec** key to send both track arm and a record commands.

11.3.3 On Transport Stop

These controls determine what happens to armed tracks when the transport is stopped.

- Activate **Disarm** so armed tracks will be disarmed.
- Activate **Stay Armed** to armed tracks stay armed for the next pass.

11.3.4 Arm While Stopped

These controls determine whether tracks can be armed when the transport is stopped.

- Activate **Allowed** to allow track arming.
- Activate **Not Allowed** to disallow track arming.

11.3.5 TC Lock

TC Lock sets the elapsed time before System 5 locks to the incoming timecode. This setting accounts for the time required by the tape deck to ramp up to its playback speed. If System 5 locks to the signal before the playback speed stabilized, the automation will not properly synchronize with the audio on the tape.

The default **TC Lock** setting is 1000 ms, which is sufficient for most devices. When active, **TC Lock** can be set using the SpinKnob. While it is desirable to set **TC Lock** to the minimum time required by the device, it is better to use a longer rather than a shorter time, to prevent an inaccurate lock before the tape speed has stabilized. We recommend 200 ms for non-linear operation.

Chapter 12: GPI/O Event System

The event system can program many System 5 features. The following features are very useful:

- use a fader to start a cart machine or turn speakers on/off;
- turn a channel on/off in response to a camera turning on/off.

An event consists of a set of input conditions governed by a logical operator that determines the output condition. Inputs can be surface parameters (i.e., channel on, fader, etc.) or external inputs via the GP132. Outputs can be System 5 parameters or external outputs via the GP132.

GP132

The GP132 (General Purpose Input/Output Relay System) is used to communicate to devices that use tallies and relays. Although the GP132 is shipped with all systems, many events do not require it.

The following special considerations should be noted when using the GP132:

- MIDI cables are used to connect GP132 to System 5. The MIDI specification for maximum cable length is 10 m. Cables over this length may cause data loss.
- If power fails on the GP132, none of the relays will function. After restoring power, the GP132 resets ALL relays.

12.1 Input Types

Table 12-1 GP Input Types, Settings, and Activation Values

Input Type	Settings	Activation Values
Control Room	Monitor A Monitor B Monitor C Monitor D Control Room Cut Control Room Dim	On Off
Cue List	Cue #	Offset
Fader	Channel #	Activation Level (dB) Activation Type (Above/Below)
GP Input	Relay Input #: (1-32) Machine: GP132 One GP132 Two GP132 Three GP132 Four GP132 Five	On Off
Switch Input	Channel # Channel EQ Filters Dynamics	On Off
Transport Ctrl	Play Stop Fast Forward Rewind Record	On Off

12.2 Output Types

Table 12-2 GP Output Types, Settings, and Activation Values

Output Type	Settings	Activation Values
Control Room	Monitor A Monitor B Monitor C Monitor D Control Room Cut Control Room Dim	On Off
GP Output	Relay Output #: (1-32) Pulse length ms (0 to latch): 0 to -1000 ms Machine: GP132 One GP132 Two GP132 Three GP132 Four GP132 Five	Open Closed
Switch Output	Channel # Channel EQ Filters Dynamics	On Off
Transport Ctrl	Play Stop Fast Forward Rewind	

12.3 Logical Operators

The logical operators process input event conditions to determine if the output event is executed.

Table 12-3 Logical Operators Used for GPI/O Event Processing

Logical Operator	Required Input Conditions for Output Event Execution	Truth Tables
AND	All input events must be true	1 AND 1 = 1 1 AND 0 = 0 0 AND 0 = 0
OR	Any input event true	1 OR 1 = 1 1 OR 0 = 1 0 OR 0 = 0
XOR	Any input event true, but *not all* true	1 XOR 1 = 0 1 XOR 0 = 1 0 XOR 0 = 0

NOTE: *All logical operators are transitive: 1 AND 0 = 0 AND 1*

12.4 Event Configuration Display

Access the **Events** configuration screen by clicking the **Events** tab at the bottom of the eMix screen. The **Events** screen has three sections: **Inputs**, **Event List**, and **Outputs**.

Several useful examples are included in Section 12.9 on page 159.

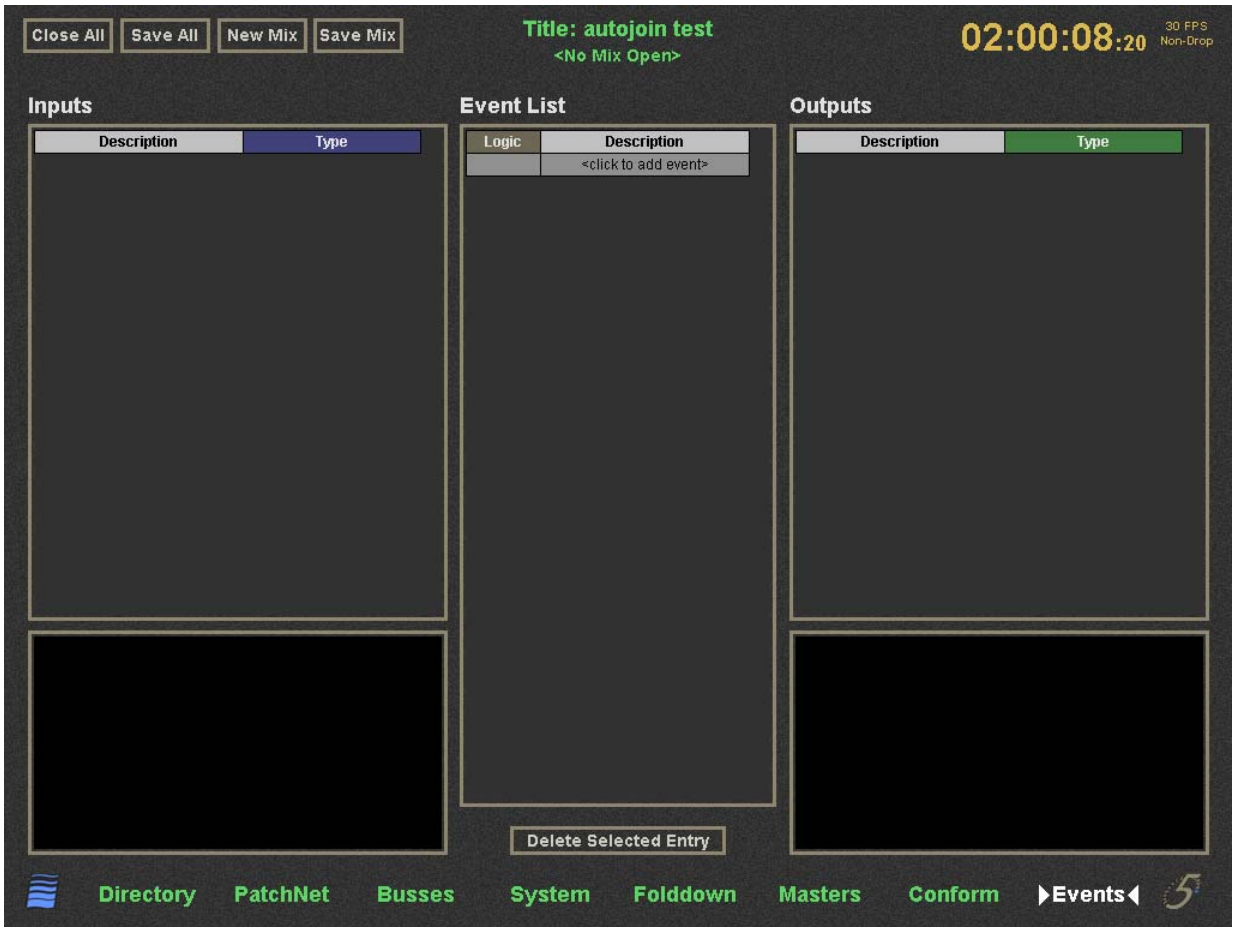


Figure 12-1 Event Configuration Window

12.5 Event List

An *event* is composed of an input description and type, a logical operator, and an output description and type. Add an event to the list by clicking the **<click to add event>** field at the bottom of the **Description** column. Click in the **Description** field to type a description. Select the logical operator from the **Logic** dropdown menu.

12.6 Input

The input area has two sections: the top contains a list of inputs for all events in the **Event List**, the lower shows the properties of the selected input.

Create a new input by clicking the **<click to add input>** field at the bottom of the list. The **Add Input Event** dialog opens to select the input type:

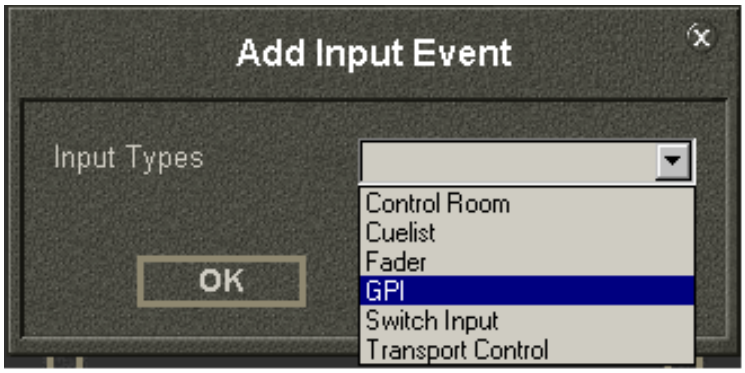


Figure 12-2 Add Input Event Dialog

Select the **Input Type** from the dropdown menu and click **OK**. Enter a text description by typing in the **Description** field; be sure to identify the event it pertains to.

The properties area displays the settings for the selected input type (see Table 12-1 and Table 12-2 for settings for each input/output type). Modify the settings by clicking on the dropdown menu and/or edit display.

12.7 Output

The output area has two sections. The top contains a list of output actions for all events in the **Event List**. These actions occur only if the input conditions for the selected event combined with their logical operator yield *True*. The lower area shows the properties of the selected output. Set the outputs using the same methods as the inputs.

12.8 Deleting Events

Delete an event by selecting the event, input, or output and pressing the **Delete Selected Entry** button at the bottom-left of the **Events** screen.

12.9 GPI Examples

Refer to Figure 12-1 and Figure 12-2 for these examples. The options available in the Input and Output Properties areas are summarized in Table 12-1 and Table 12-2.

If an event consists of just one input, AND and OR deliver the same result and may be used interchangeably.

12.9.1 Move a Fader to Turn Off the Floor Monitors

This example demonstrates how to turn off the floor monitors by moving any one of several faders above a selected level.

1. In the **Event Configuration** window, under **Event List**, click on the **<click to add event>** field.

   The **Add Event** dialog appears.

2. Select **Or** as the logical operator from the dropdown menu.

3. Under **Input**, click on the **<click to add input>** field.

   The **Add Input Event** dialog appears.

4. Select **Fader** from the dropdown menu and click **OK**.

5. Configure the Input Properties to the following settings:

   Channel # 1

   Activation level (dB) -50

   Activation Type Above

6. Repeat steps 3–5 for any additional channel faders and set the **Channel** # in step 5 to the new channel number.

7. Under **Output**, click on the **<click to add output>** field.

   The **Add Output Event** dialog appears.

8. Select **Control Room** from the dropdown menu and click **OK**.

9. Configure the Output Properties to the following settings:

   Action Monitor A

   Active State Off

12.9.2 Move a Fader to Turn On the Floor Monitors

This example demonstrates how to turn on the floor monitors by moving any one of several faders below a selected level.

1. In the **Event Configuration** window, under **Event List**, click on the **<click to add event>** field.

   The **Add Event** dialog appears.

2. Select **OR** as the logical operator from the dropdown menu.

3. Under **Input**, click on the **<click to add input>** field.

   The **Add Input Event** dialog appears.

4. Select **Fader** from the dropdown menu and click **OK**.

5. Configure the Input Properties to the following settings:

   Channel # 1

   Activation level (dB) -50

   Activation Type Below

6. Repeat steps 3–5 for any additional channel faders and set the **Channel** # in step 5 to the new channel number.

7. Under **Output**, click on the **<click to add output>** field.

   The **Add Output Event** dialog appears.

8. Select **Control Room** from the dropdown menu and click **OK**.

9. Configure the Output Properties to the following settings:

   Action Monitor A

   Active State On

12.9.3 Move a Fader to Start a Cart Machine

This example demonstrates how to start a Cart machine by moving a fader above a selected level.

1. In the **Event Configuration** window, under **Event List**, click on the **<click to add event>** field.

   The **Add Event** dialog appears.

2. Select **AND** as the logical operator from the dropdown menu.

3. Under **Input**, click on the **<click to add input>** field.

   The **Add Input Event** dialog appears.

4. Select **Fader** from the dropdown menu and click **OK**.

5. Configure the Input Properties to the following settings:

   Channel # 2

   Activation level (dB) -50

   Activation Type Above

6. Under **Output**, click on the **<click to add output>** field.

   The **Add Output Event** dialog appears.

7. Select **GPO** from the dropdown menu and click **OK**.

8. Configure the Output Properties to the following settings:

   Output Number 1

   Active State Closed

   Pulse Length 10

   Machine GP132 One

12.9.4 Move a Fader to Stop a Cart Machine

This example demonstrates how to stop a Cart machine by moving a fader below a selected level.

1. In the **Event Configuration** window, under **Event List**, click on the **<click to add event>** field.

   The **Add Event** dialog appears.

2. Select **AND** as the logical operator from the dropdown menu.

3. Under **Input**, click on the **<click to add input>** field.

   The **Add Input Event** dialog appears.

4. Select **Fader** from the dropdown menu and click **OK**.

5. Configure the Input Properties to the following settings:

   Channel # 2

   Activation level (dB) -55

   Activation Type Below

6. Under **Output**, click on the **<click to add output>** field.

   The **Add Output Event** dialog appears.

7. Select **GPO** from the dropdown menu and click **OK**.

8. Configure the Output Properties to the following settings:

   Output Number 2

   Active State Closed

   Pulse Length 10

   Machine GP132 One

12.9.5 Video Switcher Turns a Specific Camera and Channel On

1. In the **Event Configuration** window, under **Event List**, click on the **<click to add event>** field.

   The **Add Event** dialog appears.

2. Select **AND** as the logical operator from the dropdown menu.

3. Under **Input**, click on the **<click to add input>** field.

   The **Add Input Event** dialog appears.

4. Select **GPI** from the dropdown menu and click **OK**.

5. Configure the Input Properties to the following settings:

   Input # 1

   Active State On

   Machine GP132 One

6. Under **Output**, click on the **<click to add output>** field.

   The **Add Output Event** dialog appears.

7. Select **Switch Output** from the dropdown menu and click **OK**.

8. Configure the Output Properties to the following settings:

   Channel # 3

   Switch Function Channel

   Activation Value On

12.9.6 Video Switcher Turns a Specific Camera and Channel Off

1. In the **Event Configuration** window, under **Event List**, click on the **<click to add event>** field.

   The **Add Event** dialog appears.

2. Select **AND** as the logical operator from the dropdown menu.

3. Under **Input**, click on the **<click to add input>** field.

   The **Add Input Event** dialog appears.

4. Select **GPI** from the dropdown menu and click **OK**.

5. Configure the Input Properties to the following settings:

   Input # 1

   Active State Off

   Machine GP132 One

6. Under **Output**, click on the **<click to add output>** field.

   The **Add Output Event** dialog appears.

7. Select **Switch Output** from the dropdown menu and click **OK**.

8. Configure the Output Properties area to the following settings:

   Channel 3

   Switch Function Channel

   Activation Value Off

12.9.7 Audio Follow Video

In this example, there are four cameras each with a microphone configured with a video switcher, GP 132, and System 5 console (Figure 12-3).

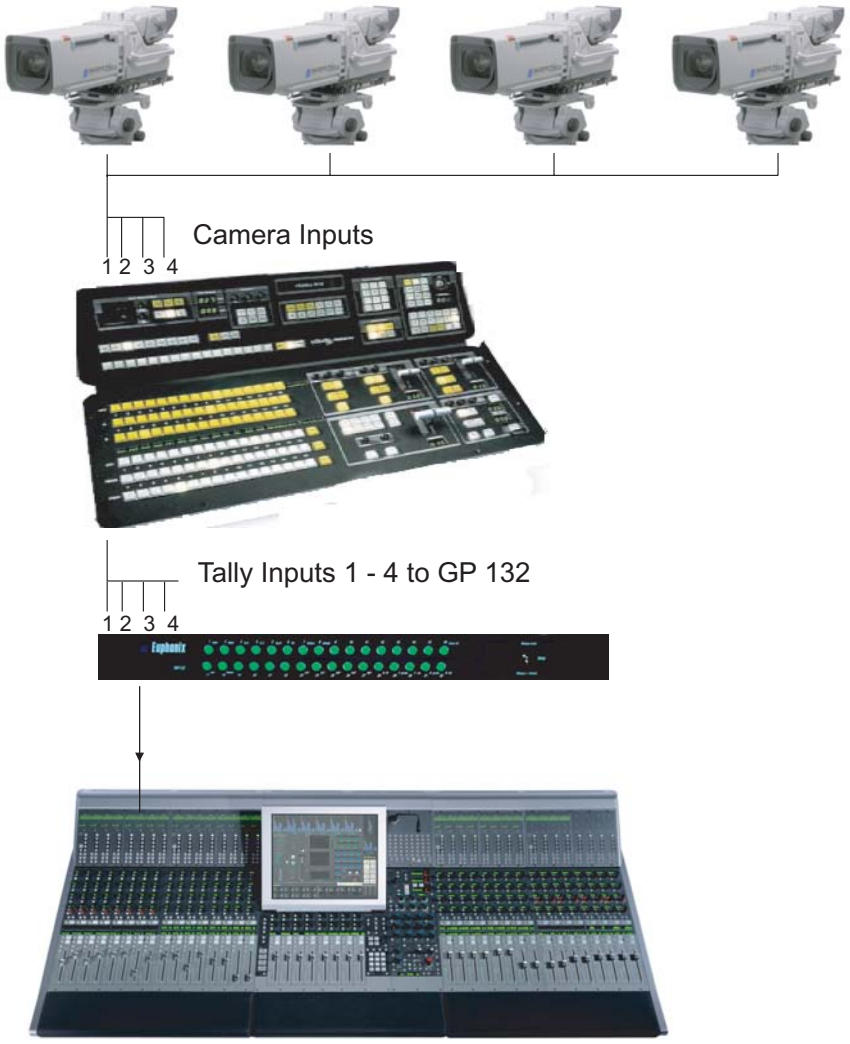


Figure 12-3 Audio Follow video configuration

The goal is to enable the following functionality:

- When the video switcher takes camera 1, channel 1's audio is on while channels 2–4 are muted.
- When the video switcher takes camera 2, channel 2's audio is on while channels 1, 3, and 4 are muted.
- When the video switcher takes camera 3, channel 3's audio is on while channels 1, 2, and 4 are muted.
- When the video switcher takes camera 4, channel 4's audio is on while channels 1–3 are muted.

The following steps explain how to turn channel 1 on and mute the other channels when the video switcher takes camera 1.

1. Choose a tally input to use on the GP 132.

   For example, tally input 1 uses pins 1 and 14 on connector RT1 of the GP 132.

2. In **Events** page of eMix, click **<click to add event>** in the Events List section, and select *OR* as the logic operator.

3. From the **Inputs** section, click **<click to add input>**.

   The Add Input Event dialog opens.

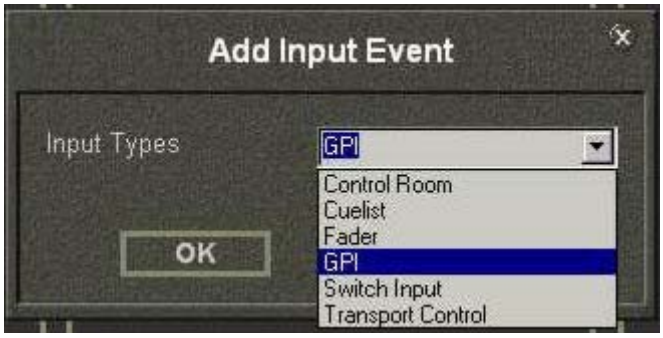


Figure 12-4 Add Input Event Dialog

4. Select **GPI** from the **Input Types** dropdown menu.
5. Configure the lower area of the **Input** section to the following settings:

Figure 12-5 Input Event Properties

6. From the **Output** section, click **<click to add output event>**.

   The Add Output Event dialog opens.

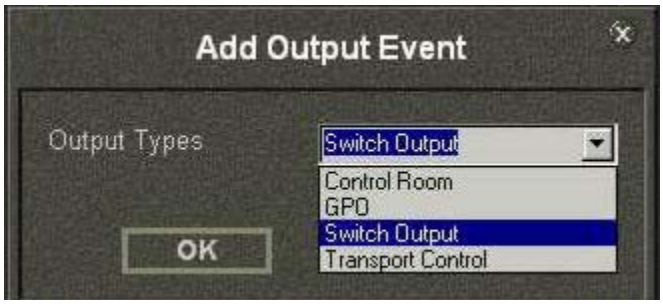


Figure 12-6 Add Output Event dialog

7. Select **Switch Output** from the **Output Type** dropdown menu.

8. Configure the lower area of the **Output** section to the following settings:

Figure 12-7 Output Event Properties

   This turns channel 1 on when camera 1 is selected by the video switcher.

9. Repeat Steps 6–7 to create additional output events to mute channels 2–4 but use the following settings instead of those depicted in Step 8:

Figure 12-8 Output Event Properties

   Figure 12-8 shows Channel 2's settings; each channel uses its own number but **Switch Function = Channel** and **Active State = off** for each.

So far, you have achieved the following functionality: when the video switcher selects camera 1, System 5's channel 1 turns on and channels 2–4 mute. Repeat the steps above to program channel 2 to turn on when the video switcher selects camera 2 and mute channels 1, 3, and 4. Each tally input requires a discrete connection at the GP 132.

Chapter 13: Dynamic Automation

13.1 Overview

System 5's dynamic automation features record and play back the movements and settings of the console faders, knobs, and switches. Each parameter displays its automation read/write status with dedicated status LEDs. System 5 provides utilities to easily rehearse automation levels before committing to recording them. After recording initial automation, several methods assist the editing process to yield smooth transitions at the punch in and out points. You can even preserve and restore previous automation passes, which further encourages experimentation without the risk of recording over previous work.

Almost every parameter can be automated but these are among the most important:

- **Input**: A and B input trim; A/B or A+B switching; insert In/Out
- **Dynamics**: compression, expansion, sidechain, and filters; In/Out
- **EQ**: frequency, gain, and Q; In/Out
- **Filters**: frequency; In/Out
- **Aux Send**: gain and pan (if not mono); On/Off
- **Pan**: standard L/R as well as LCR, LCRS, 5.1, 6.1, and 7.1; In/Out
- **Channel Fader**: the channel gain fader is touch sensitive and moves in response to recorded automation; Channel On
- **Routing**: Mix Stem On/Off

These parameters cannot be automated:

- Group bus routing
- Aux send pre/post
- Channel path order

13.2 Automation Interface

The interface for each automated channel parameter consists of their **Read/Write** automation status LEDs and **Select/Punch** keys. The center section **Automation Panel** (Figure 13-1) provides the global interface to select automation modes and functions such as Aux, EQ, Pan, and Dynamics on all channels.

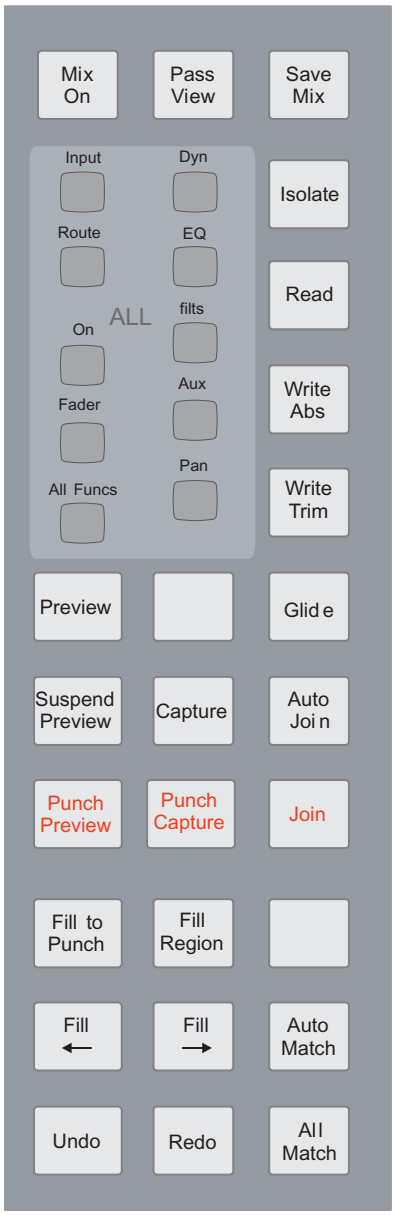


Figure 13-1 Center Section Automation Panel

13.2.1 Automation LEDs

Figure 13-2 shows the fader, switch, and knob automation interfaces. Each automated parameter has two status LEDs:

- The red LED (right) indicates the parameter is in **Write** mode.
- The green LED (left) indicates the parameter is in **Read** mode.

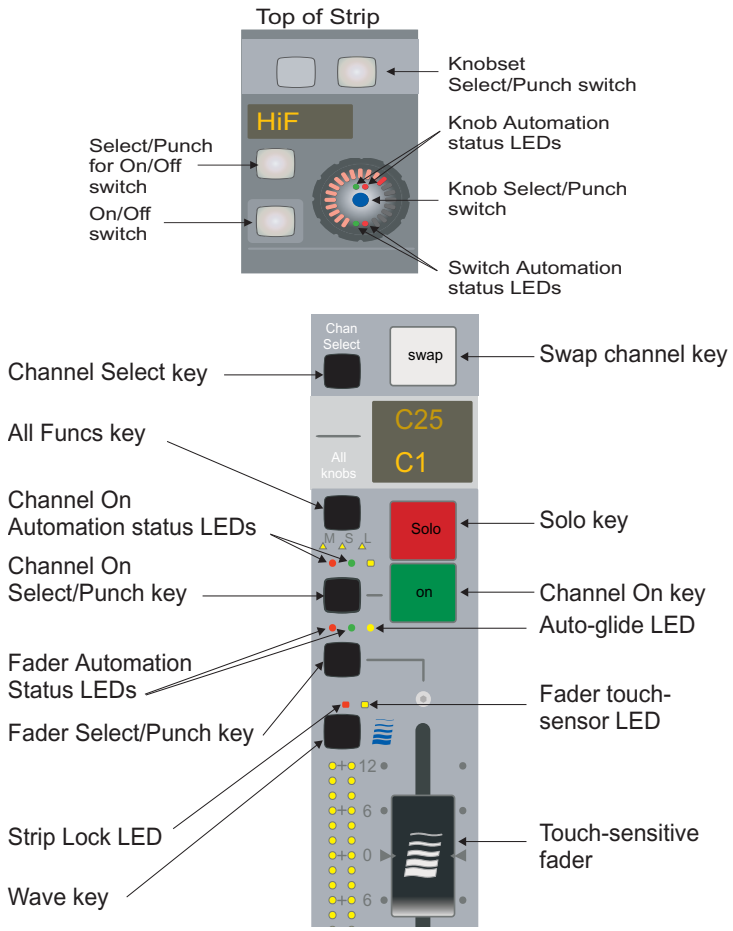


Figure 13-2 Knob (top) and fader (bottom) automation and control features

13.2.2 Select/Punch Keys

Select/Punch keys perform two functions:

- Punch the control into and out of recording automation.
- Assign the selected automation mode to its corresponding parameter.

13.2.3 All Knobs Key

The **All Knobs** key punches out all knobset parameters on the channel.

13.3 Automation Modes

Table 13-1 summarizes the four automation modes and their read/write LED state. The mode is stored along with the other parameter settings. Each mode is defined and discussed in detail in the sections following Table 13-1.

Table 13-1 Automation modes and LED states

Automation Mode	Write LED	Read LED	Description
Isolated	Off	Off	Will not record or playback automation; operates manually only. Previously recorded automation is preserved but ignored until another mode is selected.
Read	Off	Green	Replays existing Absolute and Trim data but will not record new automation.
Write Absolute	Red	Off	Records and replays Absolute automation; replays Trim data but indicates Absolute level. (Applies to Faders and Aux Sends Only)
Write Trim	Red	Green	Records and replays Trim automation; replays Absolute data but indicates Trim level.
AGlide			When enabled, the yellow LED next to the fader is on and Auto Glide is enabled. When not enabled, the yellow LED is off and the mode is Manual Glide (*Fader Glide Modes* on page 181).

13.3.1 Isolate

All parameters default to **Isolate** mode at the beginning of a new mix. A parameter in **Isolate** mode will not record or playback automation and operates manually only. If a parameter is set to **Isolate** mode after recording automation, the automation is preserved but ignored until another mode is selected. **Isolate** mode can be useful when it is important to restrict attention to automation in other functions and to provide manual control without beginning automation playback after making adjustments.

13.3.2 Read

Read mode permits replaying existing automation but will not record new data. It protects against accidentally recording new automation.

During automation playback, the control shows and plays the recorded moves: the LED level indication on the knob changes and the fader moves.

Read Suspended: Fader

Touching or moving a fader set to **Read** mode during automation playback initiates **Read Suspended** status which overrides the underlying automation with the manual fader moves. The green LED flashes rapidly and the new moves are audible *but not recorded*. Releasing the fader reverts to playing the recorded automation. This is an excellent method to rehearse automation without changing modes or recording over existing automation.

Read Suspended: Knob/Switch

Pressing the **Select/Punch** key of a knob or switch set to **Read** mode during automation playback initiates **Read Suspended** status. The green LED flashes rapidly and the new knob moves and switch states are audible *but not recorded*. Pressing the **Select/Punch** key again returns to **Read** mode.

13.3.3 Write Absolute

The parameter can record and replay Absolute automation. The red LED flashes while recording. The parameter will also play Trim automation, if it exists, but the indicator will reflect the Absolute level.

13.3.4 Write Trim

When a parameter is set to **Write Trim** mode and punched into record for the first time, the knob or fader moves to the null trim position at 0 dB. A trim range of ±15 dB can augment the Absolute value. Trim settings are maintained separately from Absolute values unless they are merged (See *Merge Trim* on page 198).

For example, moving the control up 5 dB from the null position adds 5 dB to the underlying move. Punching in and out without moving the control does not change the underlying move. Figure 13-3 shows the effect of writing new Trim data.

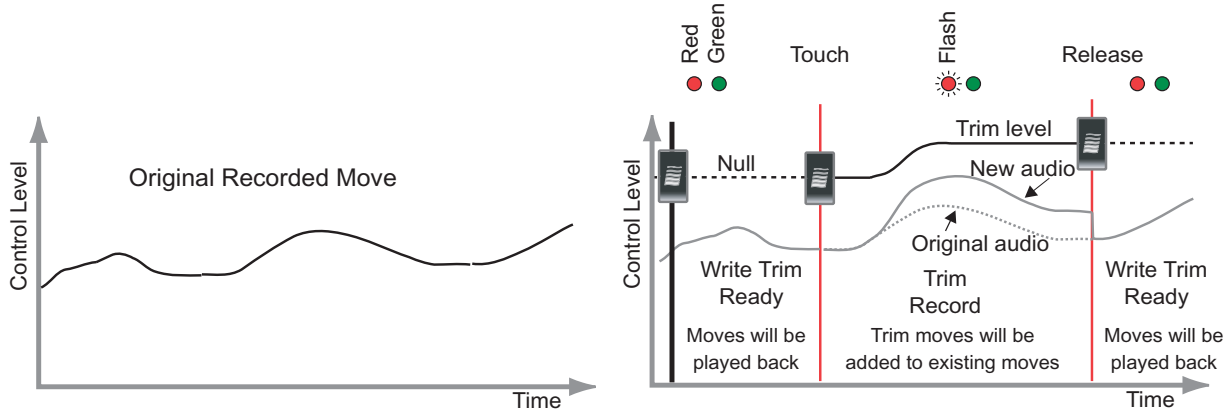


Figure 13-3 Write Trim mode adds Trim moves to Absolute automation values

13.4 Assigning an Automation Mode

Automation modes can be assigned in three ways:

- **Global Mode/Global Function**: Assign the globally selected automation mode to all console functions of a given type (i.e., EQ, Dynamics) using the center section **Automation Panel**.
- **Global Mode/Strip Function**: Assign the globally selected automation mode to selected Strip functions using the center section **Automation Panel** and **Select/Punch** keys on the Strip.
- **Strip Mode/Strip Function**: Set an individual automation mode for individually selected Strip functions.

13.4.1 Global Mode/Global Function

Set a global automation mode for all function parameters of one type using the **ALL** keys in the center section **Automation Panel**. For example:

1. Press the **Write Abs** key so it begins flashing.
2. Press the **EQ** key in the **ALL** section.

   All channel EQs are now set to **Write Absolute** mode.
3. While the **Write Abs** key is still flashing, other functions can be set to **Write Absolute** mode.
4. When finished, press the **Write Abs** key again so it stops flashing.

13.4.2 Global Mode/Strip Function

Assign a global automation mode to all knobset functions, the current knobset function, or an individual parameter on the Strip:

1. Press the **Write Abs** key in the center section Automation Panel.
2. The **Write Abs** key begins flashing and the surface controls dim.
3. Assign the selected mode to the entire knobset currently on the Strip by pressing the **Knobset Select** switch at the top-right of the Strip or at the top of the Strip's function keys (Figure 13-4).

   Assign the automation mode to *all* of the Strip's knobset parameters by pressing the **All Funcs** key.

   Assign the automation mode to an individual knob by pressing the knob's **Select/Punch** key.

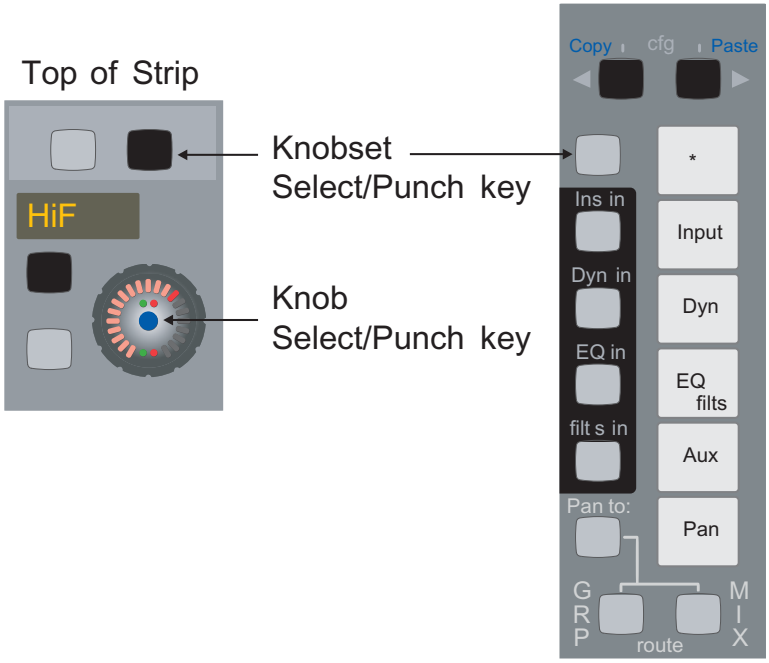


Figure 13-4 Knobset **Select/Punch** keys

4. While the **Write Abs** key is still flashing, other individual Strip functions can be set to **Write Absolute** mode.
5. When finished, press the **Write Abs** key again so it stops flashing.

13.4.3 Strip Mode/Strip Function

Assign a locally selected automation mode to an entire function or individual parameters on a Strip. For example, with EQ already assigned to the knobset:

1. Select a local automation mode by simultaneously pressing the **Wave** key and the **Select/Punch** key for the control you wish to assign.

   The screen above the Strip displays a popup menu of the automation modes. The currently active mode is highlighted in green, the other modes in yellow.

2. While still holding down the **Wave** key, press the **Knobset Select/Punch** key at the top-right of the Strip or at the top of the Strip's function keys (Figure 13-4) repeatedly until the desired mode is highlighted.

   This assigns the selected automation mode to the entire knobset. Press a knob's **Select/Punch** key instead of the **Knobset Select/Punch** key to assign the mode to that knob only.

13.4.4 Changing the Automation Mode of an Individual Parameter

Change the automation mode of an individual parameter, even if it has been assigned globally:

1. Simultaneously press the **Wave** key and **Select/Punch** key for the parameter you wish to modify.

   The screen above the Strip displays a popup menu of the automation modes.

2. While holding down the **Wave** key, press the **Select/Punch** key repeatedly until the desired mode is highlighted.

3. Release both keys to select the last mode highlighted.

NOTE: *Toggling the automation mode is closely related to setting the Glide settings. Continuing to hold down the **Wave** key and repeatedly pressing the **Select/Punch** key cycles through the automation modes. To toggle the **Glide** setting, be sure to press the **Select/Punch** key once and then release both keys.*

13.5 Recording Automation

Since **Isolate** is the default mode for all parameters, the read and write LEDs are off at the beginning of a new mixing session. Automation cannot be recorded or played back unless the **Mix On** key is lit at the top-left of the center section **Automation Panel** in Figure 13-1.

13.5.1 Knobs and Faders

To record basic fader and knob automation:

1. Press the **Mix On** button so it is illuminated.
2. Set any parameters that will record automation to **Write Absolute** or **Write Trim**.
3. Play an audio source that sends timecode into the console.
4. Press the parameter's **Select/Punch** key or touch the fader to punch in.

   The parameter's automation LED flashes red. The **Chan Select** key cannot be used to punch in an entire channel.
5. Adjust the parameter.
6. Press the **Select/Punch** key or release the fader to punch out.

   Press the **All Funcs** key to punch out all knobset parameters.

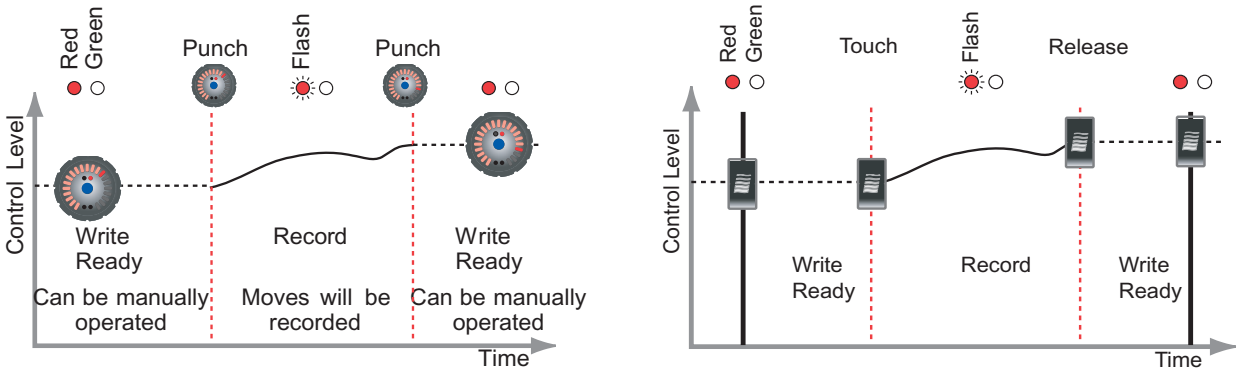


Figure 13-5 Knob (left) and fader (right) punch record methods

Additional Fader Punch Record Methods

- Record a flat move without touching the fader: punch the fader in and out with the fader **Select/Punch** key (left of Figure 13-6).

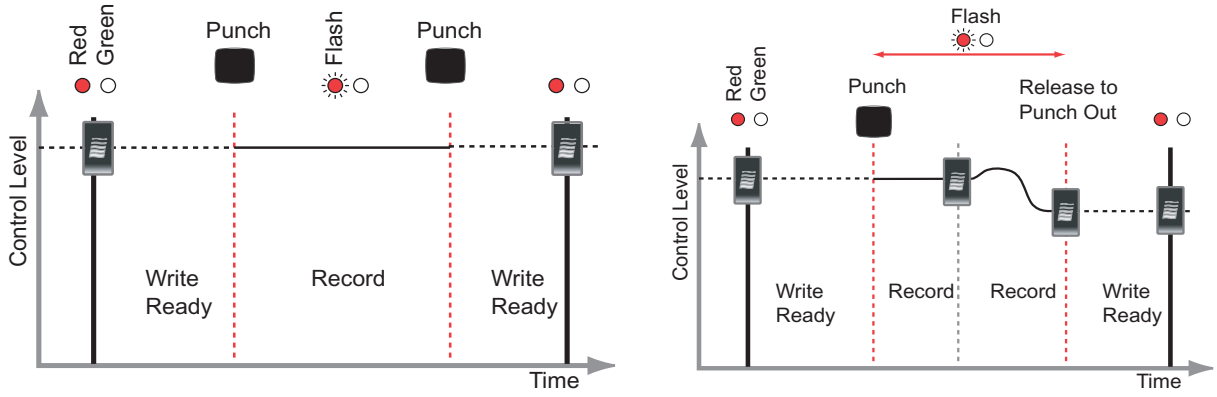


Figure 13-6 Additional punch record methods

- Punch in the fader with the fader **Select/Punch** key, move to the desired level, and release it to punch out (right of Figure 13-6).
- Touch the fader to punch in, then press the fader **Select/Punch** key to punch out.
- Touch the fader to punch in and release it to punch out.

NOTE: *See Section 13.7.1 - Fader Glide Modes for details about how the glide setting affects punch-out behavior.*

Knob Pickup

Since knobs are not touch sensitive, they cannot automatically punch in when touched like faders. **Knob Pickup** allows a knob to punch in automatically when it is *moved* enough to change the parameter's value. The knob's **Select/Punch** key must be pressed to punch out. Activate **Knob Pickup** in the **Automation Panel Page 1**.

13.5.2 Switches

Switches behave exactly like knobs and faders except their value can only be *Off* or *On*. Switches cannot record Trim data nor are they touch sensitive. Switches must be explicitly punched in and out of record using their **Select/Punch** keys unless **Switch Pickup** is activated (see below).

Switch on Release

Switch on Release (located in **Automation Panel Page 1**) causes switch activation on the *release* of the switch rather than on the *down-press*. This allows the switch to be pressed in preparation for the event and then released at the precise time.

Switch Pickup

Switch Pickup allows a switch to punch in automatically when first pressed down. The switch's **Select/Punch** key must be pressed to punch out. Activate the **Switch Pickup** key in **Automation Panel Page 1**.

NOTE: *If **Switch Pickup** and **Switch on Release** are both active, the switch will punch in when pressed down but will not toggle its value until released.*

13.6 Playing Back Automation

How a control behaves during automation playback depends on the type of control (knob, fader, switch) and on the automation mode. See Table 13-1 in Section 13.3 - *Automation Modes* for descriptions of the automation modes. This section describes only those control/mode combinations that do not respond, or begin recording automatically, when manually adjusted.

13.6.1 Write Absolute

Knob

Playing back knob automation in the **Write Absolute** mode has the following response (see Figure 13-7):

Rewind to just prior to the recorded automation, and play back the move.

- The knob can be operated manually when there is no underlying automation.
- During automation, the knob LED ring lights to indicate the current parameter value but does not respond to manual adjustment.

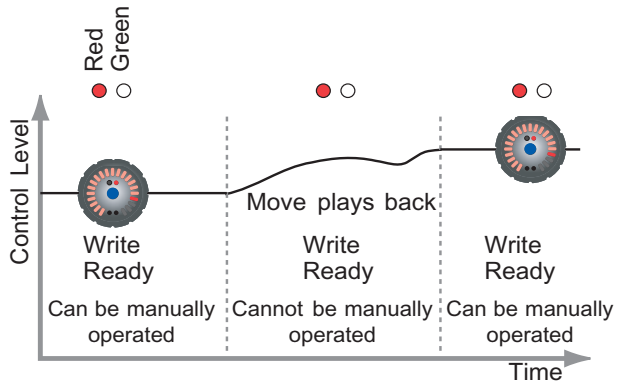


Figure 13-7 Playing a knob automation move in Write Absolute mode

Fader

During automation playback, the fader moves to reflect the recorded moves. Touching a fader during playback punches into record again. The behavior upon releasing the fader depends on the Glide setting (Section 13.7.1 - *Fader Glide Modes*).

13.6.2 Read

A control set to **Read** mode plays back but does not record automation.

Fader

Manually adjusting a fader in **Read** mode overrides the recorded automation. The manual fader moves are audible but not recorded. Releasing the fader returns control to automation playback.

Knob/Switch

Manually adjusting a knob or switch in **Read** mode during automation playback has no effect unless:

- the knob/switch **Select/Punch** key is pressed.

  OR

- **Knob Pickup** (page 178) or **Switch Pickup** (page 179) is active.

These conditions initiate the **Read Suspended** state: The green LED flashes rapidly and the new knob moves or switch states are audible *but not recorded*. This can be an effective method to rehearse automation without changing modes. Pressing the **Select/Punch** key again returns to **Read** mode.

13.6.3 Isolate

A parameter in **Isolate** mode does not play or record automation but can be manually adjusted.

13.6.4 Write Trim

Playing back Trim automation for an Aux knob or fader has the following behavior:

- While in **Write Trim** mode, the control indicates the Trim level just recorded while the audio reflects the Absolute plus the Trim level.
- Switching the control to **Read** mode does not change the audio playback but the control now indicates the total (Trim plus Absolute) audio level.

13.7 Modifying Automation

Audio engineers are well acquainted with the challenges of punching in/out to fix audio tracks without creating jarring level changes or other anomalies that call attention to the editing. Punching in/out to modify automation presents similar issues: the setting at the punch-out point must closely match the underlying automation that will resume after that point or the transition may be audible.

System 5 offers different methods for knobs and faders to modify their behavior after punching out of an automation pass: **Auto Glide** (faders only), **Manual Glide**, and **Auto-TakeOver** (**ATO**).

Auto and **Manual Glide** offer different methods to create a seamless punch-out point but both automatically glide after punching out. The only difference between them is *how* the punch out occurs:

- **Auto Glide**: The fader punches out *automatically* when released.
- **Manual Glide**: The **Select/Punch** key must be *manually* pressed.

  The **All Match** key in the center section **Automation Panel** can also punch out.

The **Automation Panel** has settings for both **A/Glide** and **M/Glide** times to glide from the level at the punch-out point to the automation level that resumes afterwards.

ATO shifts the responsibility of making the transition after punching out to the user: After manually punching out with the control's **Select/Punch** or the **All Match** key, the *user* moves the control until its value intersects the underlying automation. To make a smooth transition, this requires knowing whether the ending level is above or below the underlying automation.

13.7.1 Fader Glide Modes

Auto and Manual Glide

Auto and **Manual Glide** inter-cancel: faders are always set to **Auto** or **Manual Glide** and they toggle between values. If the yellow LED next to the Read/Write automation LEDs is illuminated, the fader is set to **Auto Glide**.

To toggle a fader’s glide setting:

1. Press and hold down the **Wave** key.
2. Press the fader’s **Select/Punch** key *once*.
3. Release both keys.

Alternately, press the **Glide** key in the Automation Panel and then the **Faders** key in the All Panel to toggle between **Auto** (Glide key lit) and **Manual Glide**.

The **Glide** key in the center section Automation Panel can also be used to toggle the fader's status:

1. Press the **Glide** key so it illuminates.
2. Press the **Chan Select** key.

ATO

ATO is independent of the fader's **Auto/Manual Glide** status. **ATO** can be set "on the fly" to override either **Auto** or **Manual Glide**:

1. While holding the fader, press its **Select/Punch** key.

   The red automation LED blinks rapidly.

2. Move the fader until its level intersects with that of the underlying automation.

   The fader automatically punches out.

The **ATO** status is not *sticky*: the current **Auto/Manual Glide** setting resumes control during the next automation record session.

NOTE: *The screen above the Strip indicates the Glide status for the knobs only, not the fader.*

13.7.2 Knob Glide Modes

Since knobs are not touch sensitive, they cannot automatically punch out when released like faders. Knobs, therefore, do not have an **Auto Glide** setting and use **Manual Glide** and **ATO** as their inter-cancelling modes.

Manual Glide functions the same way for knobs as faders: after manually punching out with the knob's **Select/Punch** or **All Match** key, the control uses the time set in the **M/Glide** field in the **Automation Panel Page 1** to glide from the setting at the punch-out point to the underlying automation.

Toggling ATO and Manual Glide

To toggle the knob's **ATO/Manual Glide** status:

1. Press and hold down the **Wave** key.
2. Press the knob's **Select/Punch** key *once*.
3. Release both keys.

The screen above the Strip indicates either **ATO** or **Manual Glide** status for the knobs only, not the fader.

NOTE: *Toggling the Glide settings is closely related to setting the automation mode. Continuing to hold down the **Wave** key and repeatedly pressing the **Select/Punch** key cycles through the automation modes. To toggle the **Glide** setting, be sure to press the **Select/Punch** key once and then release both keys.*

13.7.3 Setting Auto and Manual Glide Times

To set the **Auto Glide** time in the **Automation Panel**:

1. From the **Main Panel**, press the **Automation** button to display **Automation Panel Page 1**.
2. Enter a timecode into the **locate time** display using the numeric keypad on the center section (Figure 13-13).

   The entire time must be entered, beginning with frames. When the first numeric key is pressed, the display clears to enter the new value.
3. Press **Store Locate** and then the **A/Glide** key in **Automation Panel Page 1** to transfer the **locate time** to the **A/Glide** field.

Perform the same steps to set the **M/Glide** time but press the **M/Glide** key instead of the **A/Glide** key step 3.

NOTE: *If the **A/Glide** or **M/Glide** time is 0, a fader in that mode snaps abruptly to match the underlying automation. This is the same behavior enabled by **Snap Mode** (see Section 13.9.4 - Snap Mode).*

13.7.4 Switch Automation

Figure 13-8 summarizes most of the methods to add, erase, and modify switch automation events.

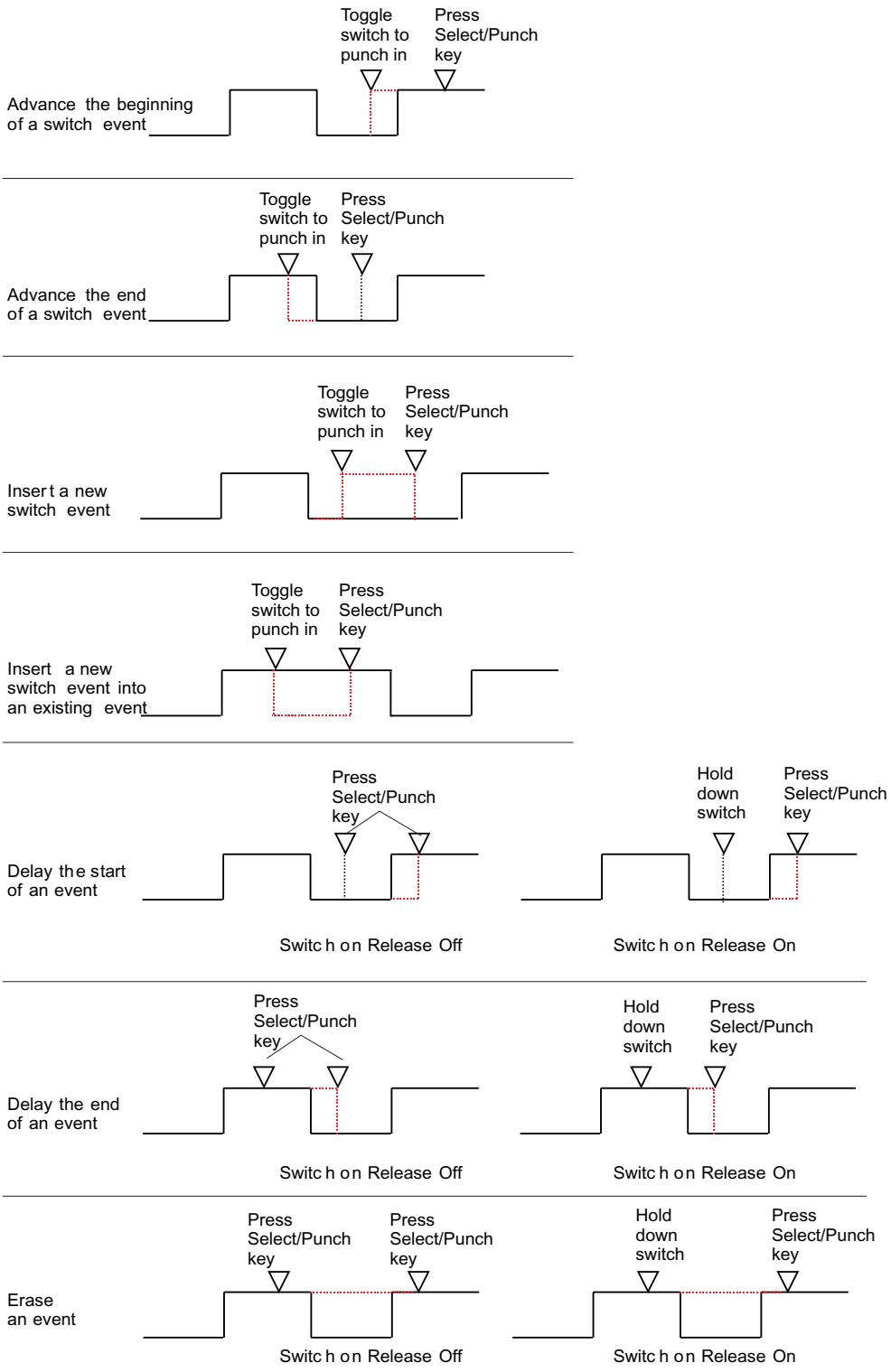

Toggle switch to punch in
Press Select/Punch key
Advance the beginning of a switch event
Toggle switch to punch in
Press Select/Punch key
Advance the end of a switch event
Toggle switch to punch in
Press Select/Punch key
Insert a new switch event
Toggle switch to punch in
Press Select/Punch key
Insert a new switch event into an existing event
Press Select/Punch key
Hold down switch
Press Select/Punch key
Delay the start of an event
Switch on Release Off
Switch on Release On
Press Select/Punch key
Hold down switch
Press Select/Punch key
Delay the end of an event
Switch on Release Off
Switch on Release On
Press Select/Punch key
Press Select/Punch key
Hold down switch
Press Select/Punch key
Erase an event
Switch on Release Off
Switch on Release On

Figure 13-8 Adding, erasing, and modifying the times of switch automation events

13.8 Fill Features

To understand the utility of System 5's Fill features, consider the following situation:

> In a new mix, fader automation is recorded from 00:01:00:00 to 00:02:00:00 and from 00:04:00:00 to 00:05:00:00. What initial fader value is used if recording or playback begins at 00:03:00:00?

Because there is no automation written at this time, it is called *virgin territory.* System 5 uses two methods to derive a value for the fader:

- First, it looks back from the current position to the beginning of the mix for the last value recorded. In the example above, it would use the last fader value at the punch-out point (00:02:00:00).
- If no valid value is found, it looks forward for the nearest valid value from the current position to the end of the mix.

This method makes it unnecessary to do a complete initial pass just to write a setting throughout the mix; the engineer can record moves only where they are needed.

It is sometimes desirable, though, to write nominal values in all, or selected areas of the mix and System 5 provides utilities to accomplish this: **AutoFill, Fill Start, Fill End, Fill Region,** and **Fill to Punch**.

13.8.1 AutoFill

AutoFill writes the value at the punch-in point back to the beginning of the mix (or previous punch-out point) and to the end of the mix (or next punch-in point). **AutoFill** can only be used during a parameter's first automation pass, which ends when the tape stops; more than one punch in/out is permitted. If automation has already been recorded for that parameter, **AutoFill** can be set to *On* but will have no effect. **AutoFill** acts independently on **Absolute** and **Trim** automation but has only one setting.

Figure 13-9 shows the results of a first automation pass recording fader movements in two discontinuous sections. Figure 13-10 (left) shows the resulting fader values with **AutoFill** Off. The dotted lines indicate virgin territory and the level derived for the fader if the tape were located there. Figure 13-10 (right) shows the resulting fader values with **AutoFill** On. The flat solid lines, marked *Filled*, indicate where **AutoFill** wrote values. Two or more discontinuous punch sections can be used during the first pass *only if the tape is not stopped before recording the additional punch in/out sections*.

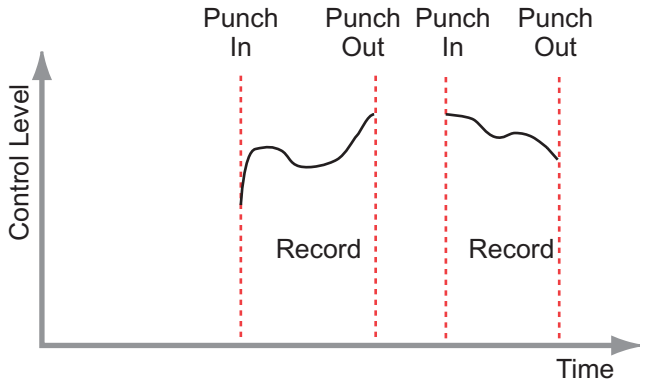


Figure 13-9 Fader values recorded during first pass

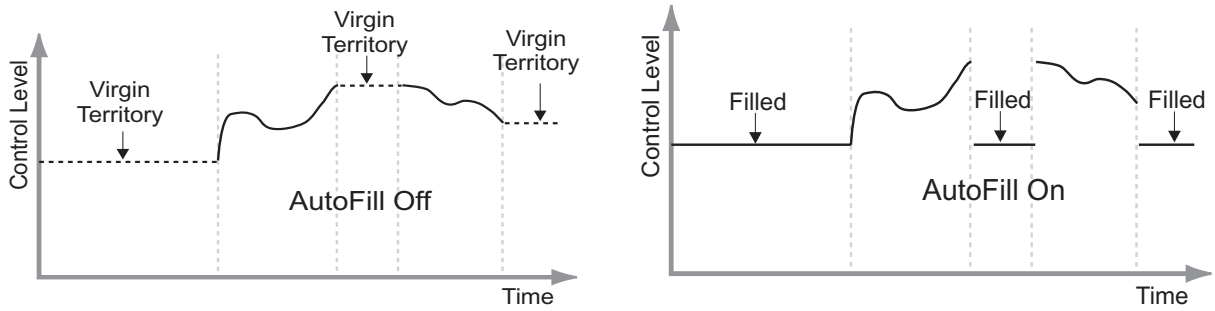


Figure 13-10 Fader values resulting from the first pass with AutoFill Off (left) and On (right)

Figure 13-11 shows the results of punching in for a second pass after a first pass with **AutoFill** Off (left) and On (right). With **AutoFill** Off, the initial fader value cannot be derived by looking earlier in the mix so the value from the first punch-in point is used instead. With **AutoFill** On, the initial value has already been written so the new section merely replaces the section filled by **AutoFill**.

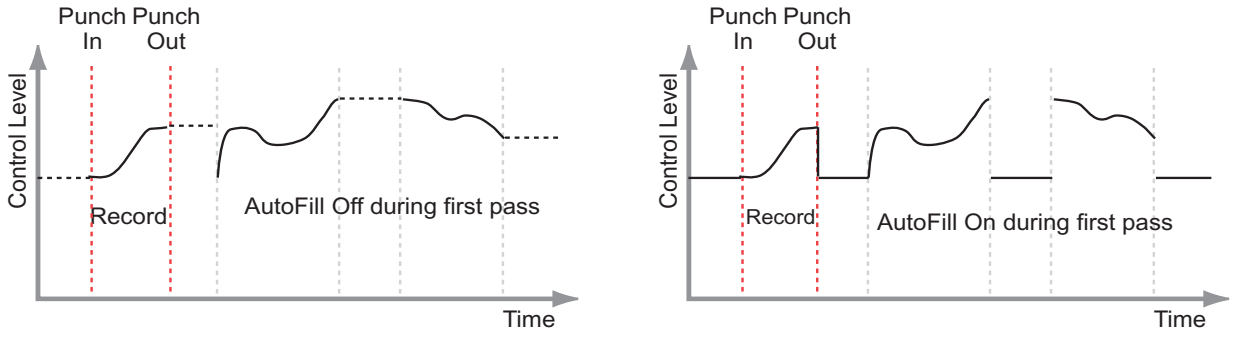


Figure 13-11 Recording a second pass after AutoFill was Off (left) and On (right) during first pass

Setting AutoFill to On

AutoFill defaults to *Off* so you must set it explicitly to *On* prior to the first pass.

1. From the **Main Panel**, press the **Automation** button to display **Automation Panel Page 1**.
2. Press the **Page >** key to display **Automation Panel Page 2** (Figure 13-12).
3. Press the **AutoFill** key to enable AutoFill for the first pass.

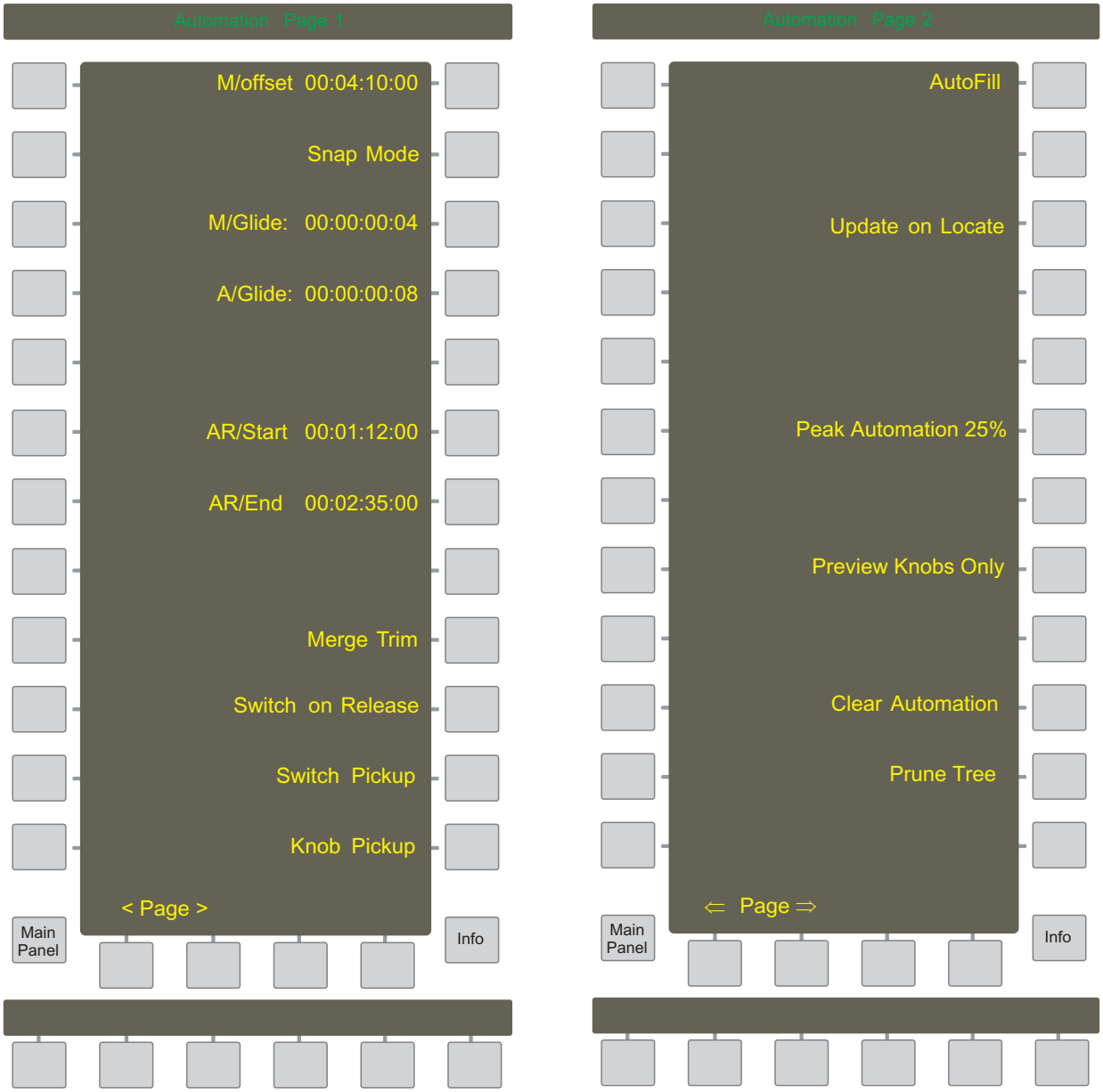


Figure 13-12 Automation Panel

13.8.2 Fill Start

1. Press the **Fill Start** key in the center section automation panel.

   The **Fill Start** key flashes.
2. Punch in the parameter and adjust the control to the desired level.
3. Punch out and the level at that time is written to the start of the mix.

   The **Fill End** key stops flashing indicating it is no longer active.

Fill Start is useful for writing mutes to the beginning of a song.

1. Locate to the Title start.
2. Set all Fader On switches to **Write Absolute** mode for channels that should *not* be active at the song start.
3. Punch in, mute the On switch and punch out just before the song actually starts.

   This mutes the channel back to the Title start.

13.8.3 Fill End

1. Press the **Fill End** key in the center section automation panel.

   The **Fill End** key flashes.
2. Punch in the parameter and adjust the control to the desired level.
3. Punch out and the level at that time is written to the end of the mix.

   The **Fill End** key stops flashing indicating it is no longer active.

Fill End is useful to quickly fill a static value to the end of a mix without recording to the end.

NOTE: *Pressing **Fill Start** or **Fill End** twice in rapid succession will cause the key to latch on so it remains active after the pass ends.*

13.8.4 Fill Start + Fill End

1. Press **Fill End** then **Fill Start** in the center section automation panel.

   Both keys should be illuminated.

2. Punch in the parameter and adjust the control to the desired level.
3. Punch out and the level at that time is written throughout the mix.

Using **Fill Start** and **Fill End** together is a useful way to set a static value all the way through the mix.

13.8.5 Setting Fill Start and End Times

The **Fill Region** features, discussed in the next sections, require setting the **AR/Start** and **AR/End** time fields in **Automation Panel Page 1**. The **Fill Region** key *must be lit for these times to be used*.

1. From the **Main Panel**, press the **Automation** button to display **Automation Panel Page 1**.
2. Enter a timecode into the **locate time** display using the numeric keypad on the center section (Figure 13-13). The entire time must be entered, beginning with frames. When the first numeric key is pressed, the display clears to enter the new value.

   A time can also be entered by recalling a Cue (see *Cue Points* on page 148).
3. Press **Store Locate** and then the **AR/Start** key in **Automation Panel Page 1** to transfer the **locate time** to the **AR/Start** field.
4. Enter the **AR/End** time into the **locate time** display by repeating step 2.
5. Press **Store Locate** and then the **AR/End** key in **Automation Panel Page 1** to transfer the **locate time** to the **AR/End** field.

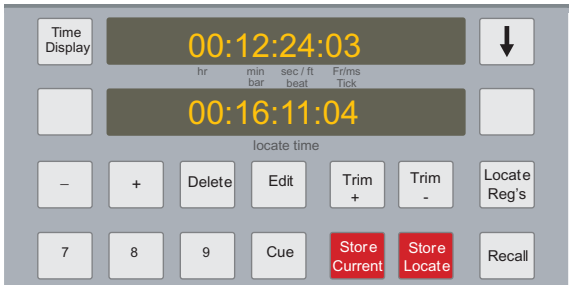


Figure 13-13 Setting times in the machine control panel

To adjust the **AR/Start** time by a few frames:

1. On the center section, press **Recall** then **AR/Start** to transfer the **AR/Start** time to the **locate time** display.
2. Press the **Trim +/-** keys to alter the value in one frame increments.
3. Press **Store Locate** and then **AR/Start** to transfer the new value to the **AR/Start** field.

To modify the **AR/End** time, perform the same steps but substitute the **AR/End** for the **AR/Start** key.

NOTE: *To set **AR/Start** and **AR/End** times, the center section **Fill Start** and **Fill End** keys can be used interchangeably with the **AR/Start** and **AR/End** keys.*

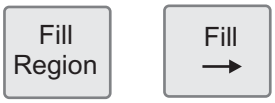
13.8.6 Fill Region + Fill Start + Fill End

Fill Region is used in combination with **Fill Start** and **Fill End** to set a value for a defined region rather than throughout the mix. The punch-out point must be within the defined region for the fill to apply.

1. Record a fader level from 00:01:00:00 to 00:02:00:00 so you can see how the new level will override an existing one.
2. Enter 00:01:00:00 into the **AR/Start** field and 00:02:00:00 into the **AR/End** field.

   See Section 13.8.5 - *Setting Fill Start and End Times* to see how to set the times.
3. Now activate **Fill Start**, **Fill End** and **Fill Region**.
4. Record new fader movements in this section and punch out at the desired level. The new level will be written from 1 to 2 minutes.

13.8.7 Fill Region + Fill End



1. Set the **AR/End** time.

   See Section 13.8.5 - *Setting Fill Start and End Times* to see how to set the times.
2. Activate **Fill End** and **Fill Region**. Do not activate **Fill Start**.

3. Punch in, adjust the control, and punch out.

   The value at the punch-out time is written to the time set for **AR/End**.

13.8.8 Fill Region + Fill Start

1. Set the **AR/Start** time.

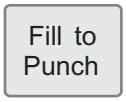
   See Section 13.8.5 - *Setting Fill Start and End Times* to see how to set the times.

2. Activate **Fill Start** and **Fill Region**. Do not activate **Fill End**.

3. Punch in, adjust the control and punch out.

   The value at the punch-out time is written to the time set for **AR/Start**.

13.8.9 Fill to Punch



Fill to Punch and **Fill Start** inter-cancel; selecting one deselects the other. **Fill to Punch** behaves like **Fill Region** except the area is not designated prior to punching in by setting **AR/Start** and **AR/End** times. **Fill to Punch** writes the value at the punch-out time back to the punch-in time.

13.9 Automation Performance Utilities

13.9.1 Preview

Preview mode provides an easy method to set a parameter to the desired level without recording the moves required to locate that level. When the **Preview** key is illuminated, the first punch-in action (touching a fader or pressing the **Select/Punch** key) punches that parameter into **Preview** mode. The parameter can then be adjusted and set to the desired level. The next punch-in action punches that parameter into its Automation mode at that level. Turning **Preview** off cancels any parameters with Preview levels.

Preview mode is activated from the center section **Automation Panel** (Figure 13-1). This allows previewing the move without changing the automation mode.

Suspend Preview

Suspend Preview makes it easy to record automation without removing parameters designated for Preview. Press the **Suspend Preview** key so it is illuminated to display and hear the underlying automation rather than the Preview level. The parameter will punch in at the Preview level regardless of the state of the **Suspend Preview** key.

Punch Preview

Press the **Punch Preview** key to punch in all parameters in Preview mode at their level set when punched out in the Preview pass. Activating the **Punch Preview** key automatically illuminates the **Suspend Preview** key.

Knobs and Switches

Punching in a knob or switch set to **Write Absolute** (or **Write Trim** for the knob) with **Preview** On allows manual changes to the parameter but ignores underlying automation. Pressing the **Select/Punch** key a second time punches in with the selected automation mode.

This feature is useful to record an abrupt change. For example, to shift the Pan setting from the current setting of extreme left to extreme right:

1. Activate **Preview** in the center section **Automation Panel**.
2. Select **Write Absolute** mode for the Pan knob on the desired Strip.
3. Press the Pan **Select/Punch** switch and set the control to extreme right.
4. At the appropriate point, press the **Select/Punch** key again and the previewed level will be recorded from that point until **Select/Punch** is pressed again to punch out.

Faders

Preview for a fader can be initiated by touching the fader or pressing the **Select/Punch** key. To punch into record from **Preview**, press either the fader's **Select/Punch** key or the **All Match** key in the center section.

Preview remains active after the punch out so the fader stays in manual control until the tape stops and the pass is complete.

Preview Knobs Only

This option allows entering preview mode on the knobs only while writing moves on the faders.

13.9.2 Join

When the tape stops while recording automation, the pass ends and any parameters still recording are automatically punched out. It is useful to remember which parameters were punched in when the tape stopped so they can be punched back in automatically during the next pass. **Join** and **Auto Join** offer different ways to accomplish this automatic punch-in function.

Press the **Join** key during the pass in which you wish to remember the punched in parameters. After stopping the tape and resuming recording automation, press the **Join**

key again to punch in all parameters from the last pass.

Auto Join

Press the **Auto Join** key during the pass in which you wish to remember the punched in parameters. After stopping the tape, rewinding, and resuming recording automation, all parameters from the last pass are automatically punched in when the tape arrives at the end of the last pass.

13.9.3 Capture

Press the **Capture** key to take a snapshot of all objects currently in record or preview and stores their values in the a **Capture Buffer**. If no objects are in record or preview, no action is taken and the current Capture Buffer is maintained.

Punch Capture

Press the **Punch Capture** key to drop all objects in the **Capture Buffer** into record at their captured values.

13.9.4 Snap Mode

Snap Mode overrides the **A/Glide** or **M/Glide** times for knobs and faders set to **Auto** or **Manual Glide** by causing the knob or fader to abruptly shift from the level at the punch-out point to the underlying automation level. **Snap Mode** is activated in the **Automation Panel Page 1**.

13.9.5 Update on Locate

Update on Locate controls how automation values are derived when the tape is relocated between playbacks. When active, the automation values from the new location are loaded *before* beginning playback. **Update on Locate** should usually be active when automation values are stable and not being edited or recorded. It is located is in **Automation Panel Page 2**.

When **Update on Locate** is inactive, the last value used during the previous playback for that parameter is retained at the new location *prior* to playback. When playback begins, the current location's value (or the value derived from looking ahead or back) is used. However, if the parameter is punched into record *prior* to beginning playback, the *previous* setting is used. This is useful if you have experimented with setting a parameter during the previous playback and wish to use that setting to begin another section.

13.9.6 All Match

All Match (bottom-right) punches out *all* parameters currently recording and glides/snaps them back to their underlying automation value.

13.9.7 Auto Match

Auto Match automatically snaps to the underlying automation when timecode stops.

13.10 Synchronizing Automation with an External Device

System 5's automation can be synchronized to incoming timecode from an external device, such as a tape recorder. **TC Lock** and **TC Slave**, available from the **Setup** menu in the **Machines Panel**, establish the type and sensitivity of the synchronization.

13.10.1 TC Lock

TC Lock sets the elapsed time before System 5 locks to the incoming timecode. This setting accounts for the time required by the tape deck to ramp up to its playback speed. If the console locks to the signal before the playback speed stabilized, the automation will not properly synchronize with the audio on the tape.

The default **TC Lock** setting is 1000 ms. When active, **TC Lock** can be set using the SpinKnob. We recommend starting at 200 ms and increasing in 50 ms increments until the automation is free of errors.

13.11 Bus Master Automation

The Bus Masters can be automated using the same modes as a normal channel. The automation mode popup list appears in the standard channel's graphic display, next to the Bus Master Strip.

13.12 Mix Assigns

The mix bus section legs can be automated like any other switch. The switch that accesses the legs from the mix route page is the center switch. The **Select/Punch** (bottom left) switch is used to assign the legs.

13.13 Managing the Automation

13.13.1 Group Coalesce

Group Coalesce transfers automation from the Control Group master fader to the slaves.

1. Press the Panel Viewer's **Main Panel** key.
2. Press the **Groups** button to display the **Groups Panel**.
3. Press the **Coalesce** key at the bottom of the **Groups Panel**.

   The **Coalesce** key begins flashing.
4. Press the **Groups** key for the group to coalesce.

All master fader moves get transferred to the slaves and the Control Group is deleted.

13.13.2 Mix Passes

A *mix pass* is created each time an automation punch in occurs until the tape stops. If the tape stops before the last parameter punches out, the pass consists of all automation from the first parameter punched in to when playback stops. If playback stops *after* a punch out, the pass ends when the last parameter punches out.

Each pass is stored automatically and numbered chronologically. All mix passes are saved with a Mix and loaded when the Mix is re-opened (see *Save Mix* below).

View Mix Passes

Press the **Pass View** key at the top of the center section **Automation Panel** to display the **Pass Tree**. To navigate through the Pass Tree to activate a different pass:

1. Rotate the SpinKnob clockwise to move to higher pass numbers, counter-clockwise to move to lower numbers.
2. Press the **Enter** key to select the highlighted pass.

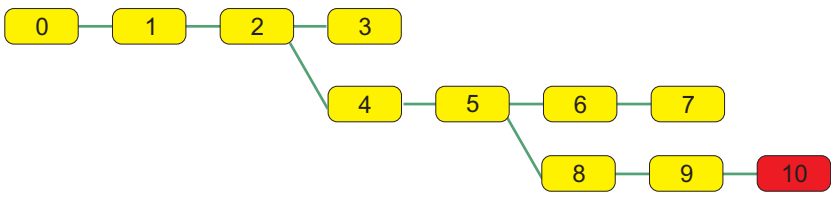


Figure 13-14 Mix Pass tree

The following analysis of the example Pass Tree in Figure 13-14 explains most of the Tree's features:

- Pass 1 contains additional automation but is based on automation created in Pass 0. Pass 1 may have new automation, modify Pass 0's automation, or both.
- Pass 2 is derived from Pass 1 in a similar manner as Pass 1 from Pass 0.
- Pass 3 is derived from Pass 2.
- Pass 4 is derived from Pass 2, *not from Pass 3*. Pass 3 may have been an experiment the user wished to save but not continue using.
- Pass 5 is derived from Pass 4.
- Pass 6 is derived from Pass 5.
- Pass 7 is derived from Pass 6.
- Pass 8 is derived from Pass 5, *not from Pass 7*. Passes 6 and 7, like Pass 3, have been saved but not used to continue in the Tree.

Prune Tree

Pruning the mix tree deletes all passes that are not in the direct line from the first to the last pass. In Figure 13-14, passes 3, 6, and 7 would be deleted but the existing numbers are retained. This frees up space and simplifies complicated trees. Prune the tree only when you are sure you will not need the information in those passes.

1. Press the **Prune Tree** key in **Automation Panel Page 2**.
2. Confirm at the bottom of the panel to prune the pass tree.

Merge Trim

Merge Trim adds the Trim data to the Absolute automation. This operation does not change the audio but does set the Trim automation to zero. When a Trim move yields a satisfactory modification, it is simpler to use **Merge Trim** to keep all the automation in the Absolute domain. **Merge Trim** also permits the full 15 dB range for further trim operations, if necessary.

Clear Automation

Clear Automation deletes all automation passes leaving only an empty pass 0.

NOTE: *Since this erases all automation, be careful before executing this command!*

---

1. Press the **Clear Automation** key in **Automation Panel Page 2**.
2. Confirm at the bottom of the panel to clear automation.

Mix Offset

Normally, the **current time** display shows the absolute timecode from the beginning of the tape. It can be useful to show a different time in the **current time** display. For example, set the beginning of a song within the tape to 00:00:00:00 so the song time is readily visible.

To offset the current mix against the incoming timecode:

1. Enter an offset value into the **locate time** display using the numeric keypad or recall a Cue.

   The entire time must be entered, beginning with frames. When the first numeric key is pressed, the display clears to enter the new value.

   A time can also be entered by recalling a Cue (see *Cue Points* on page 148).
2. Press the **Store Locate** key followed by the **M/Offset** key in **Automation Panel Page 1** to store the value in the **locate time** display.

   Press the **Store Current** key to store the value in the **current time** display.

Save Mix

The mix can be saved from the eMix directory software on the System Computer. It is faster, though, to use the dedicated **Save Mix** key in the center section to save the mix and automation passes to disk. See Chapter 4: *eMix Application* for more detailed information on the file system.

Peak Automation Indicator

The **Peak Automation** indicator **Automation Panel Page 2** (Figure 13-12) indicates how hard the automation system is working.

13.13.3 Automation Conform

As video or film sections are inserted, deleted, and moved during post-production, the **Conform** utility realigns the automation data to match the edited film. It is important to emphasize that **Conform** affects the automation data only; the audio must be realigned in a separate operation.

Most film editing programs (i.e., AVID Film Composer) produce an Edit Decision List (EDL) with the start time, end time, and duration for each edit, along with the type of operation (insert, delete, move), and perhaps a name or other descriptive information for the edit. The **Conform** utility *does not process the EDL automatically*. The EDL provides the information that is manually input to the **Conform** utility.

Navigating the Conform Screen

From the bottom of the **eMix** screen on the System PC, press the **Conform** tab. The

Conform screen appears (Figure 13-15).

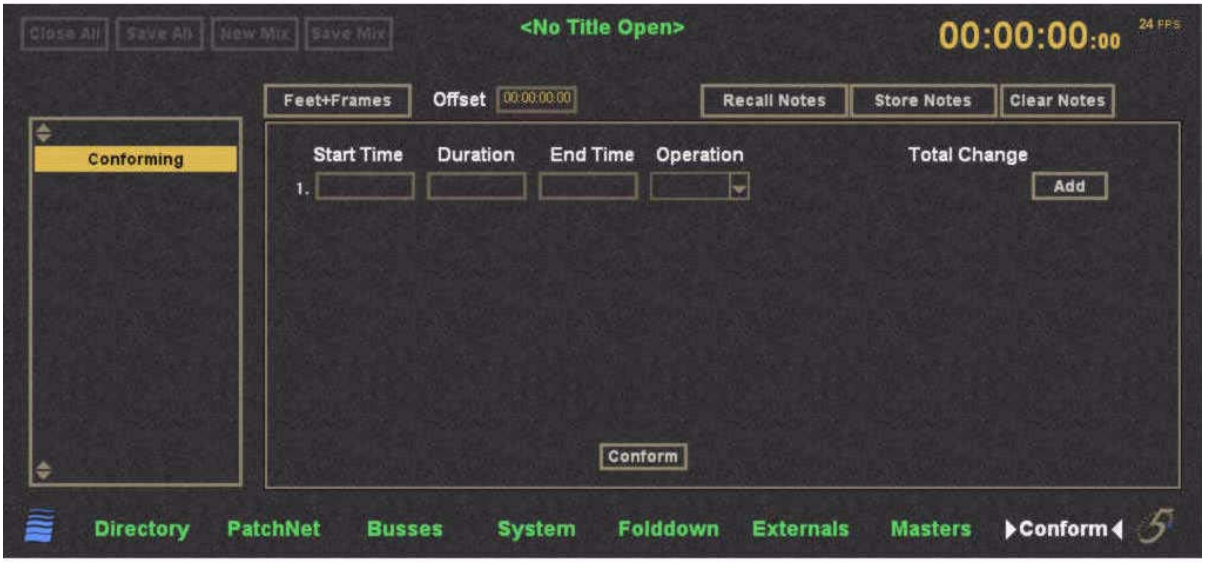


Figure 13-15 Conform screen

Each entry, called a *note*, appears in chronological order and consists of a **Start Time**, **Duration**, **End Time**, **Operation**, and **Total Change**.

Hot Keys

- **Tab** and **Shift+Tab**: Moves to next/previous field. This may trigger time fields to be calculated and displayed.
- **Arrow Up/down**: Moves to the previous/next entry.
- **Page Up/Down**: Scrolls up/down the list by one page.
- **Home/End**: Scrolls to the top/bottom of the list.
- **Shift+Page Up/Down**: Scrolls to the top/bottom of the list.

Operation Types

Four **Operation** types are selected from a popup menu:

- **Delete –** The **Duration** between the **Start** and **End Times** is deleted.
- **Insert –** The **Duration** between the **Start** and **End Times** is inserted.

  The inserted section is blank; it contains no automation data.
- **Move –** This consists of two operations: a *delete* from the **Start** to the **End Time** followed by an *insert* of the same data at the time designated in the **to** field, which appears to the right of the **Move** operation field.
- **Copy –** This consists of two operations: a *copy* from the **Start** to the **End Time**

followed by an *insert* of the same data at the time designated in the **to** field, which appears to the right of the **Move** operation field.

When the **Operation** field is selected, typing *m*, *i*, c, or *d* on the keyboard selects **Move**, **Insert**, **Copy**, or **Delete**, respectively.

Time Display

Click the button labeled **FeetFrames** or **SMPTE (**above the **Start Time** field) to toggle between formats. Figure 13-15 shows the Conform screen with SMPTE times.

If Feet+Frames is selected:

- Entering a number into the Frames field larger than 16 will be converted automatically into FeetFrames.
- Entering a single number, instead of two numbers separated by +, is assumed to be Frames and is automatically converted to FeetFrames.

If SMPTE is selected:

- The number entered is parsed in two-digit intervals starting from the right. For example, if 321215 is entered, the field is resolved to 00:32:12:15.
- Enter two-digit numbers separated by **:** and they will be parsed right to left. For example, if 12:34:22 is entered, the field is resolved to 00:12:34:22.
- If a number greater than 59 is entered into the seconds or minutes field, it is properly converted. For example, if 12:78:14 is entered, the field is resolved to 00:13:18:14.
- If a number greater than or equal to the FPS value stated in the upper right of the Conform screen is entered into the Frames field, it is properly converted. At 24 FPS, if 12:18:32 is entered, the field is resolved to 00:12:19:08.
- The maximum number that can appear in the hours field is 23.

Entering Notes

Click in the **Start Time** field to begin entering a note. Press the **Enter** or **Tab** keys on the keyboard to move one field to the right. The fields do not have to be entered from left to right and some fields are calculated automatically. For example, you can select an **Operation** before setting time fields. If **Start** and **End Times** are entered, the **Duration** field is calculated automatically. If **Start Time** and **Duration** fields are entered, **End** is calculated automatically. The **Total Change** field is not set by the user but is calculated automatically. It displays the net time change for all notes up to and including the present one.

When all notes fields have been filled with valid entries, you must press the **Add** button, which automatically enters the note in chronological order with respect to the other notes. Pressing **Enter** or **Tab** with all fields filled with valid entries is equivalent to clicking the **Add** button. When the number of notes exceeds the maximum screen size, a scroll bar

appears to display additional pages. Figure 13-16 shows all three operation types.

Figure 13-16 Conform screen with notes

For a **Move** operation, fill in the first row, including the **to** field. These values are used to automatically calculate the corresponding insert row after clicking the **Add** button. The **to** field designates the **Start Time** for the inserted data and the **Duration** is identical to that of the deleted data. The inserted row does not have an **Operation** field and may not be adjacent to the row labeled **Move**. Each row is processed in the order in which it was entered.

Offset

The initial **Offset** value is derived from the **FeetFrames o-set** field in the **Locate Registers Panel**. However, entering a new value in the **Offset** field updates the value in the **FeetFrames o-set** field in the **Locate Registers Panel**. **Offset** is always stated in SMPTE format regardless of the Conform screen's display format.

Since the **Offset** is most commonly used to designate the film's reel number, the first reel uses an **Offset** value of 00:01:00:00. When toggling to SMPTE, the **Offset** is added to the values in the time fields. For example, if a **Start Time** field has a value of 0+6 and the **Offset** is 00:01:00:00, clicking **FeetFrames** changes to **SMPTE** and the **Start Time** now displays 00:01:00:06.

Storing and Recalling Notes

The tabs above the notes area are for global operations and file maintenance:

- **Clear Notes**: removes all note entries from the current Conform screen;

  The notes are *not* automatically cleared after a Conform operation.
- **Store Notes**: stores the current notes using a standard Windows file saving dialog box;
- **Recall Notes**: recalls a notes file into the current screen using a standard Windows file opening dialog box.

Executing the Conform Operation

After all notes have been entered and verified, press the **Conform** button at the bottom-center of the screen. The **Execute Conform** dialog box appears (Figure 13-17) to confirm you wish to proceed. This realigns the automation with the edited film.

Figure 13-17 Execute Conform dialog box

Each Conform operation adds a new pass to the Pass Tree. To undo the Conform operation, return to the pass prior to the pass just created (Section 13.13.2 - *Mix Passes*).

After the Conform operation, the notes remain displayed in the Conform screen. Be careful to avoid clicking the **Conform** button again as this will mis-align the data. If the button is clicked twice by mistake, undo the second Conform operation.

Chapter 14: CM403 Film/Post Module

14.1 CM403

The CM403 fulfills the requirements for a traditional PEC/Direct monitoring system for the post-production environment. It can be used in single- and multi-operator System 5 consoles. Up to four Post Panels can be installed in a single system. The form factor of the CM403 is the same as the other CM40x standard control modules. The CM403 houses a TFT and has three same-size panels (i.e., the Film Panel and the Dual-Joystick Panel). The film panel can be placed above or below the joysticks depending on the preference of the operator. The user has the option of placing their own motion controller or other third-party equipment into the spare panel.

14.2 The Film Panel

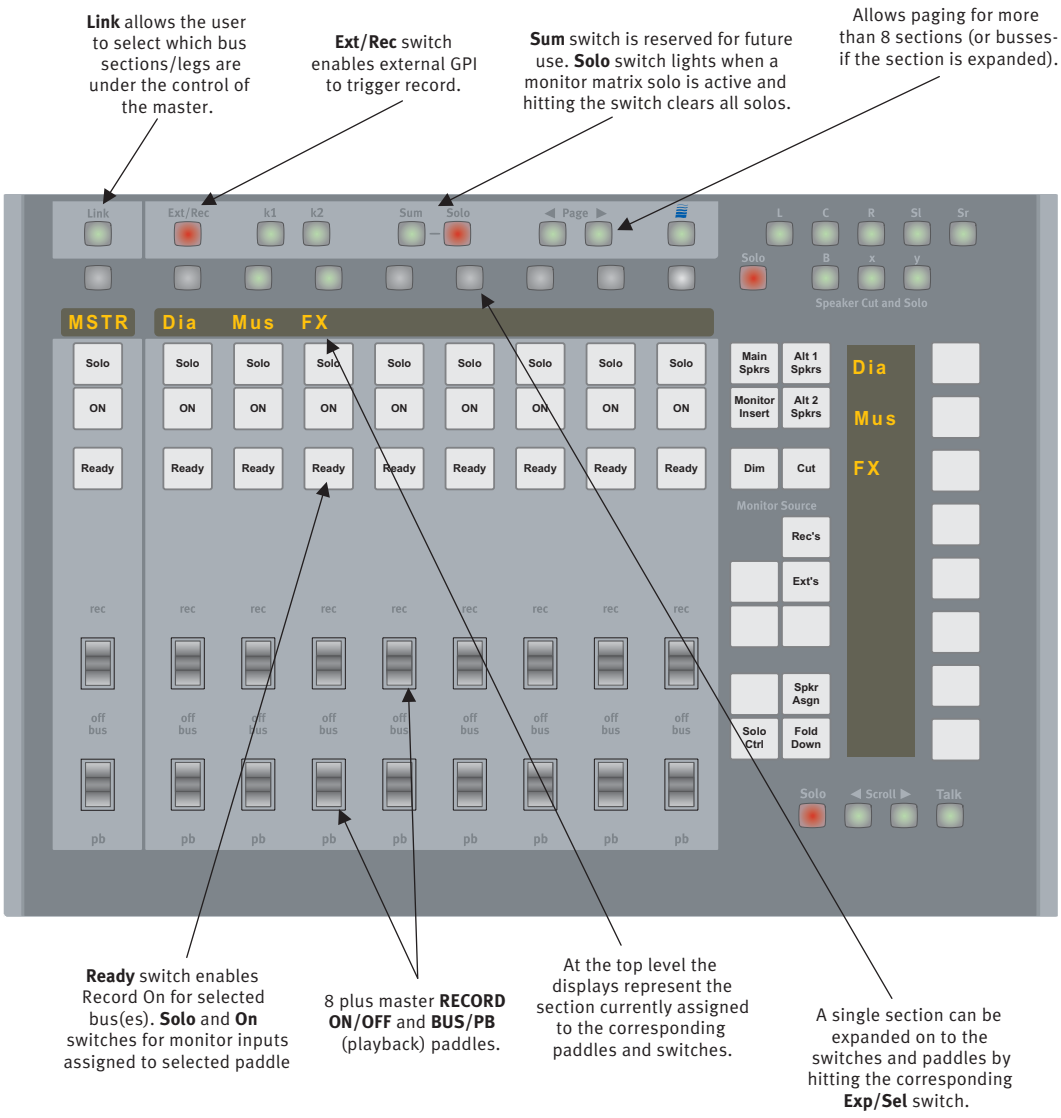


Figure 14-1 Post Panel Interface

The Film Panel is divided into two distinct parts: the traditional PEC/DIR panel on the left, and an additional utility panel to the right. The right panel duplicates most of the CM401's monitoring and setup functions.

14.2.1 The PEC/DIR Panel

This panel houses the traditional paddles used for PEC/DIR, Bus/Playback, or Bus/Tape switching. The second set of paddles are used to put track(s) into record. There are eight paddle strips, with associated switches above them, and a master control strip.

Bus/Tape switching on the paddles is consistent with the Dir/Ret CR Source switching on the CM401 (see Section 5.1 *Monitoring*) between the Mix busses and their associated returns. However, it is possible to switch not only the whole bus section but also the individual busses (legs).

By default, each mix bus section is assigned to a paddle. The master simply controls all linked bus sections at once: press the **On** switch on the master and all linked **On** switches turn *On*. The bus section name appears in the four-character display. All operations take place within the monitor matrix and affect only the main CR monitors.

Turn a section *On* and it is sent to the monitors (same as the CM401 monitor section), solo a section and anything currently assigned to the main monitors is removed, leaving only the required section. The bus section Bus/Playback switch toggles between listening to the mix busses and their associated returns. The **Ready** switch enables dropping the tracks associated with the bus section into record using the record paddle.

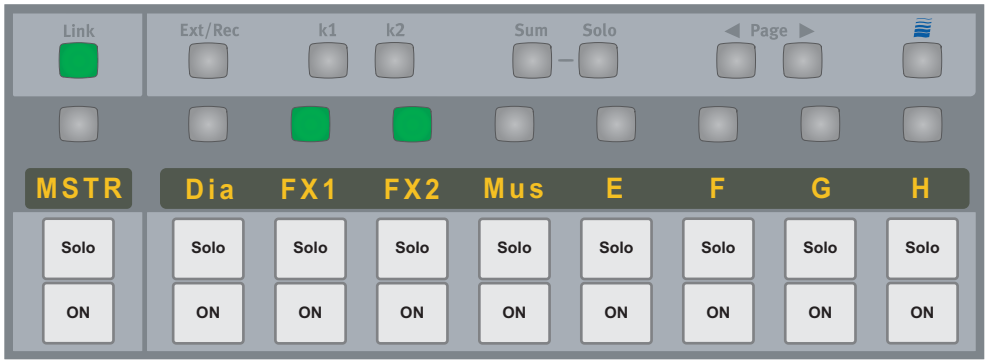


Figure 14-2 Link Key Lit

Link Key: When the **Link** key is lit, the user can select which sections to link to the master strip paddles and switches. For example, in Figure 14-2, only the fx1 and fx2 sections are affected by the master controls.

When the **Link** key is not lit, the keys directly above the display allow the user to descend a level. This means that the busses within the selected bus section are now assigned to the paddles and the master strip becomes the selected bus section strip.

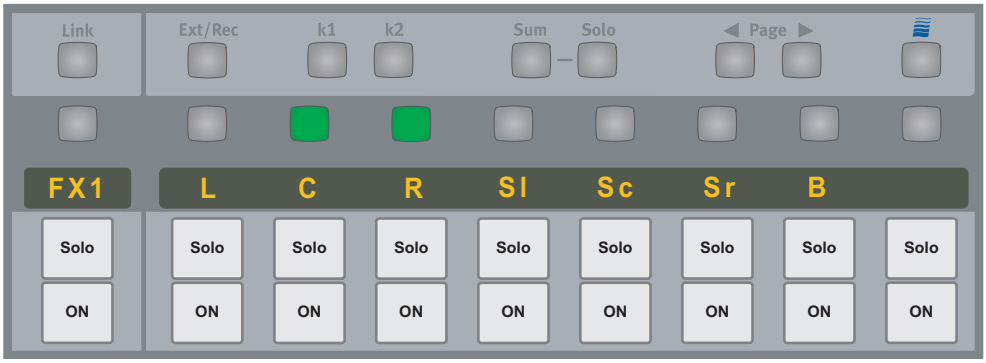


Figure 14-3 Link Key Not Lit

The same functionality applies when the Link key is not lit except the individual busses are accessed.

The Link operation also still applies and allows the user to dictate which busses within the section would be affected by the master. Here the *C* and the *R* busses are lit to indicate they are linked to the master strip.

Press the **Exp/Sel** key on the master strip to return the panel to the top level again.

< Page > Keys: These keys switch the display between two pages of eight-bus sections.

Sum and Solo Keys: The **Solo** key lights when something is in solo; pressing the lit **Solo** key clears the current solo. The **Sum** key is reserved for future use.

Ext/Rec Key: When the **Ext/Rec** key is lit, the master record paddle can be triggered remotely from a GPI.

k1, k2 Keys: These keys are used to toggle the **Ext/Rec** between record and preview, k1 record (master record paddle), and k2 preview (master PEC/DIR paddle).

Wave Key: Future versions will use this key for shifted functions.

14.2.2 The Monitor Utility Section

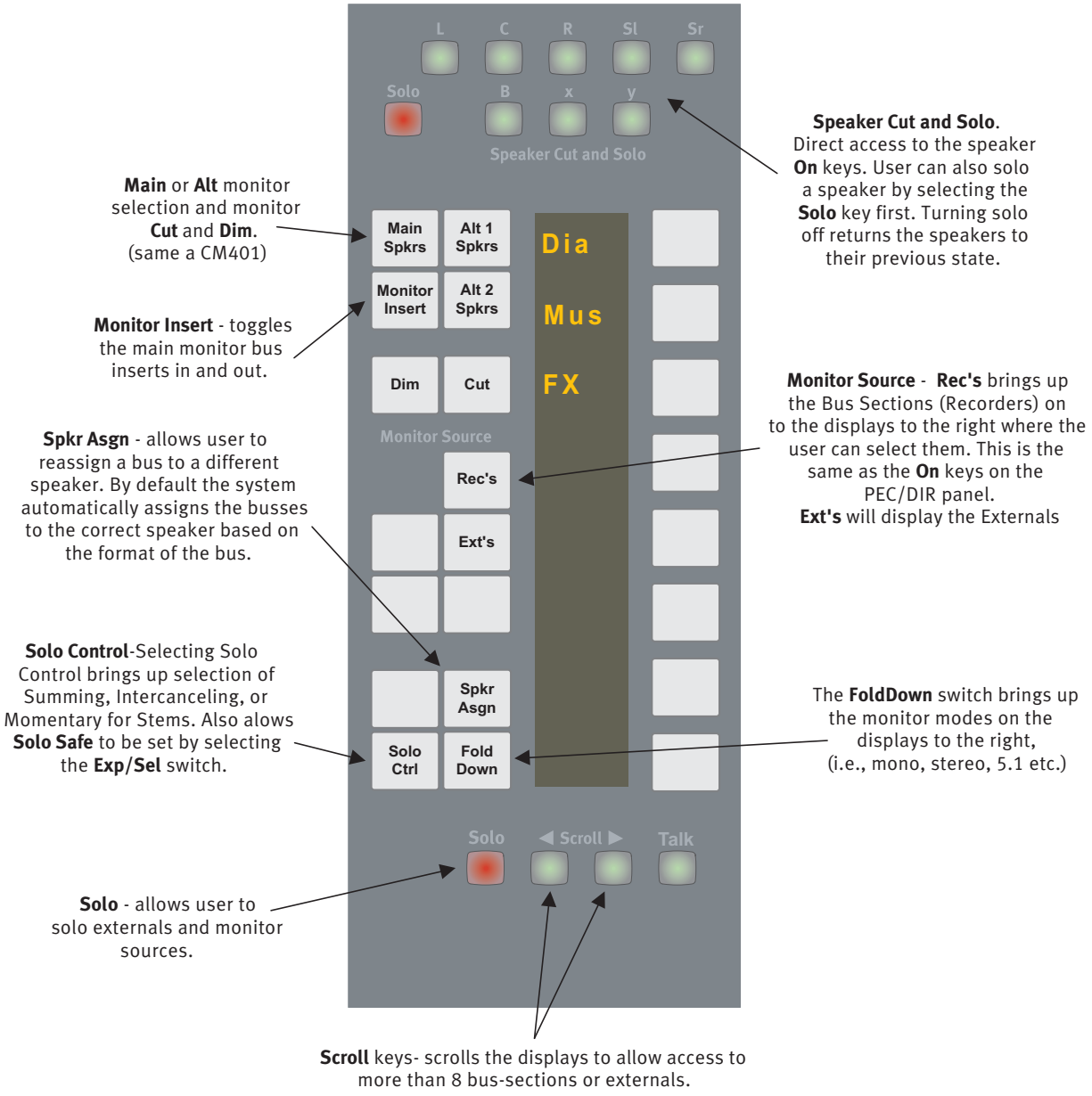

L
C
R
Sl
Sr
Solo
B
x
y
Speaker Cut and Solo
Speaker Cut and Solo. Direct access to the speaker On keys. User can also solo a speaker by selecting the Solo key first. Turning solo off returns the speakers to their previous state.
Main or Alt monitor selection and monitor Cut and Dim. (same a CM401)
Main Spkrs
Alt 1 Spkrs
Monitor Insert
Alt 2 Spkrs
Dim
Cut
Dia
Mus
FX
Monitor Insert - toggles the main monitor bus inserts in and out.
Monitor Source - Rec's brings up the Bus Sections (Recorders) on to the displays to the right where the user can select them. This is the same as the On keys on the PEC/DIR panel. Ext's will display the Externals
Monitor Source
Rec's
Spkr Asgn - allows user to reassign a bus to a different speaker. By default the system automatically assigns the busses to the correct speaker based on the format of the bus.
Ext's
Solo Control-Selecting Solo Control brings up selection of Summing, Intercanceling, or Momentary for Stems. Also alows Solo Safe to be set by selecting the Exp/Sel switch.
Spkr Asgn
Solo Ctrl
Fold Down
The FoldDown switch brings up the monitor modes on the displays to the right, (i.e., mono, stereo, 5.1 etc.)
Solo
◀ Scroll ▶
Talk
Solo - allows user to solo externals and monitor sources.
Scroll keys- scrolls the displays to allow access to more than 8 bus-sections or externals.

Figure 14-4 Monitor Utility Section

Most of these functions already exist on the current CM401 (see Section 5.1 *Monitoring*). The only new feature is *Spkr Asgn*, (Speaker Re-Assign).

Speaker Re-Assign

The system automatically sends mix busses to the correct monitor bus based on the bus format. For example, when monitoring *fx1,* the left bus of the section is automatically sent to the left monitor bus. It is sometimes necessary to override this assignment and send a mix bus to a different monitor bus than was intended.

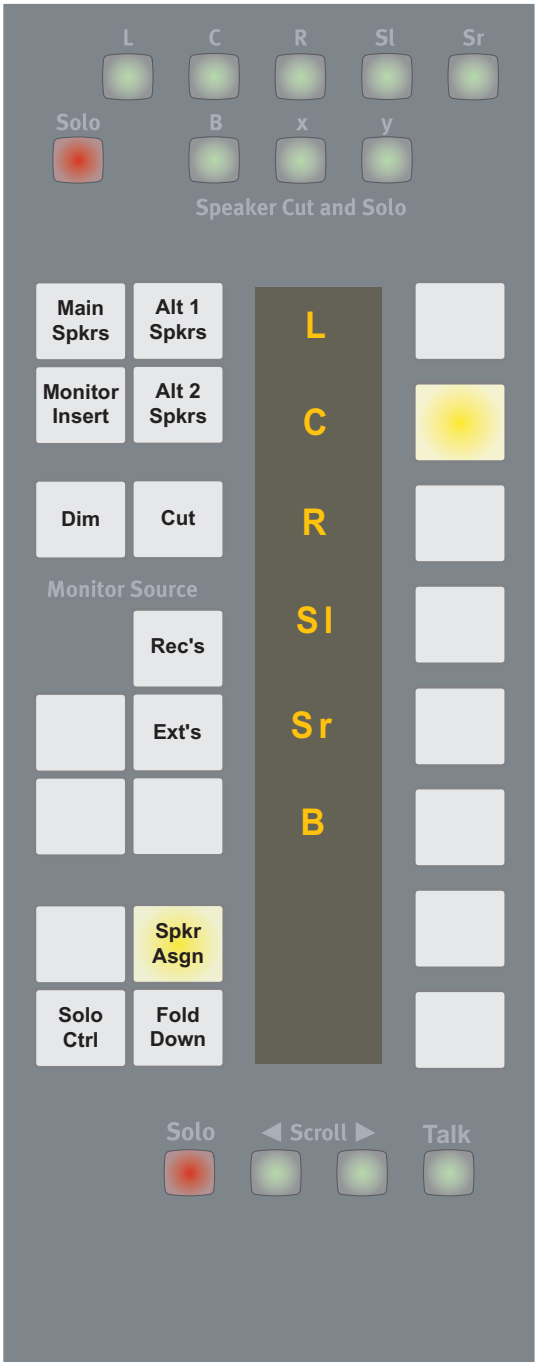


Figure 14-5 Speaker Re-assign

It is now possible to use the **Exp/Sel** keys above the displays on the PEC/DIR paddle to select busses within a section. When a bus is selected, the **Speaker Re-Assign** panel illuminates the current monitor bus assignment. Selecting a different speaker from the panel re-assigns the bus within the monitor matrix.

Solo Control

The **Solo Control** switch controls the solo modes, which are similar to the those in the CM401: summing, intercancel, momentary, and safe.

Solo Safe is applied to the stems by selecting the **Exp/Sel** key above the stem you wish to make *safe*.

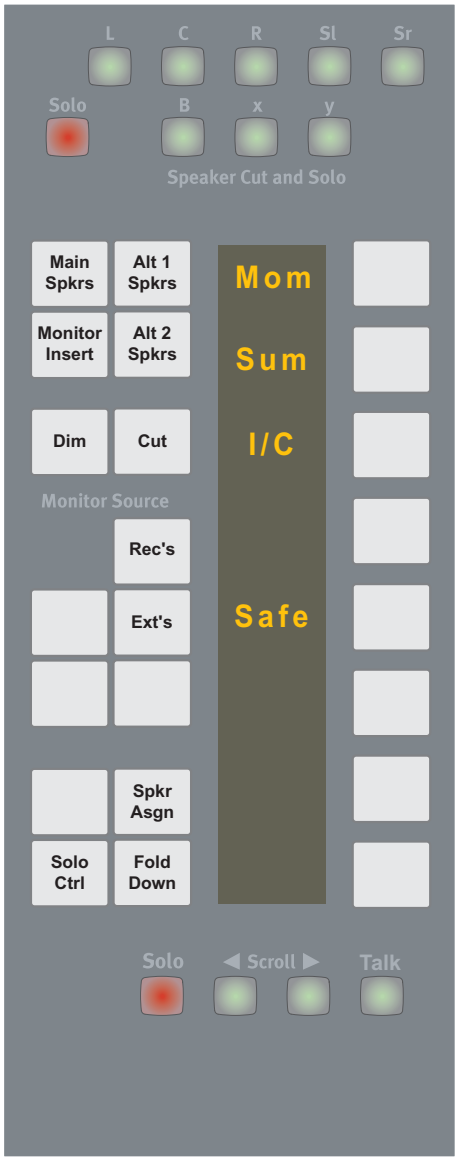


Figure 14-6 Solo Safe

14.2.3 CM403 TFT Display

The TFT screen displays meters and an overview of the monitor bus assignments.

Metering Display

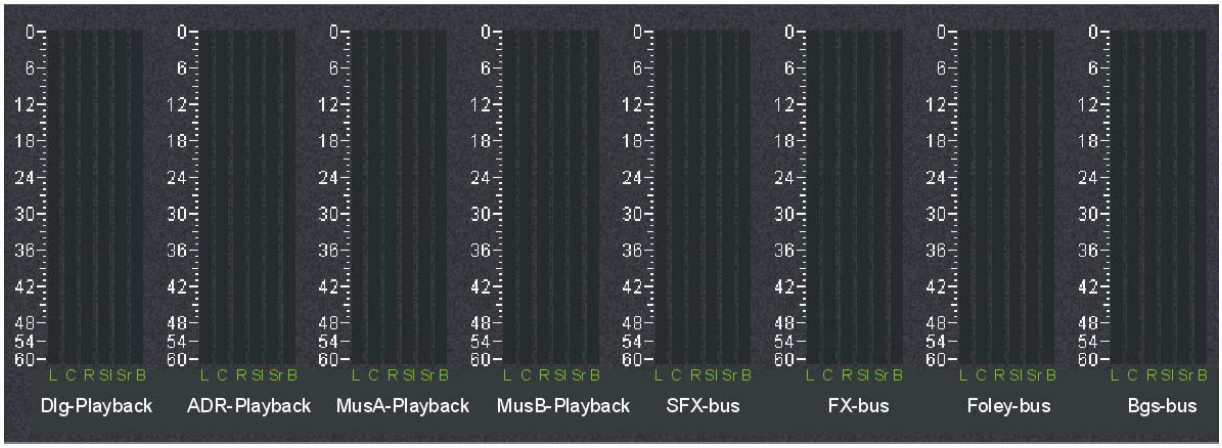


Figure 14-7 Top Level Metering Display

The meters track whatever is currently assigned to the paddles. The send and return for each bus are displayed on separate meters.

At the top level, where the paddles are assigned to the bus sections, eight meters can be displayed for each of the mix busses within the section.

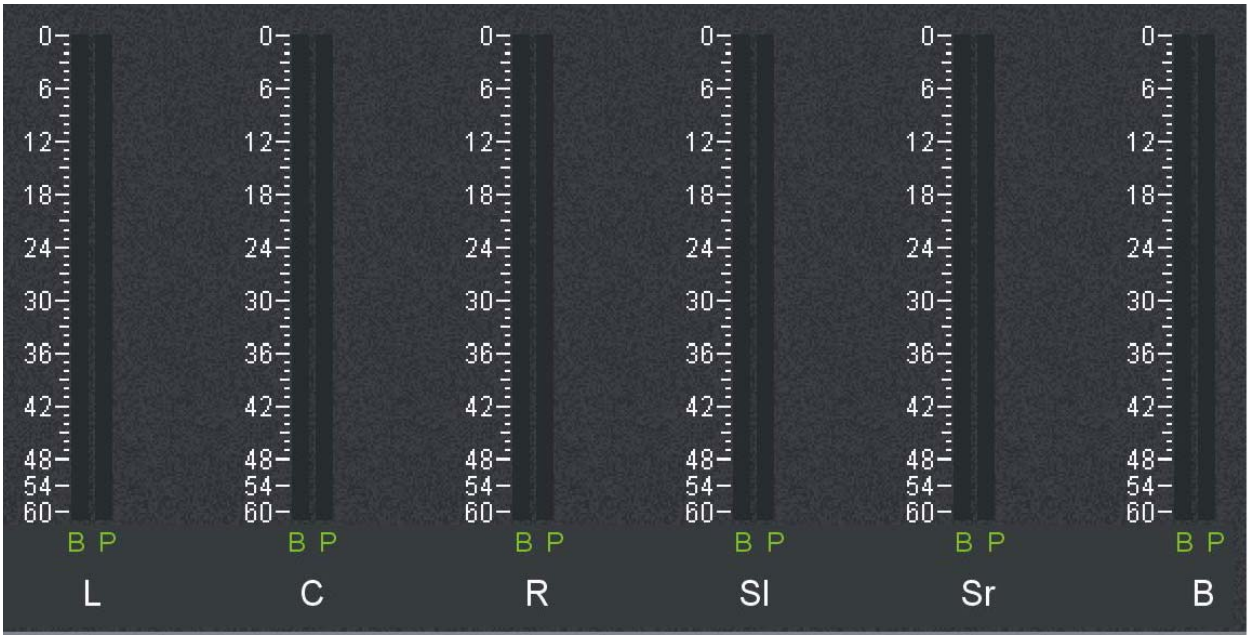


Figure 14-8 Bus Level Metering Display

Bus/Track and Monitor Assignments Display

The lower half of the screen displays 48 mix busses across the top, the first eight bus sections down the side, and the eight speaker (main monitor bus) outputs.

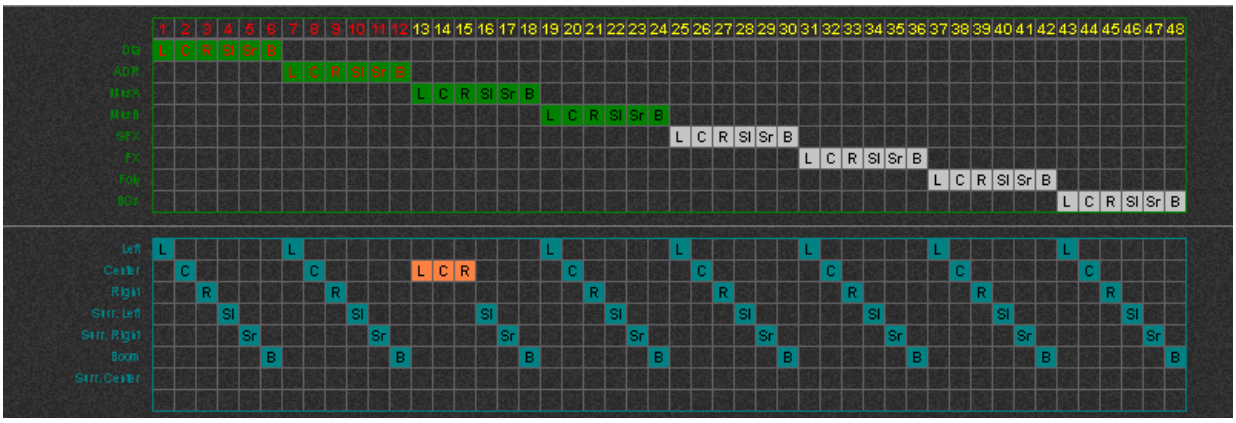


Figure 14-9 Bus/Track and Monitor Assignments Display

14.3 Joystick Module

Two joysticks are housed in a full-width panel mounted in a CM403 module.

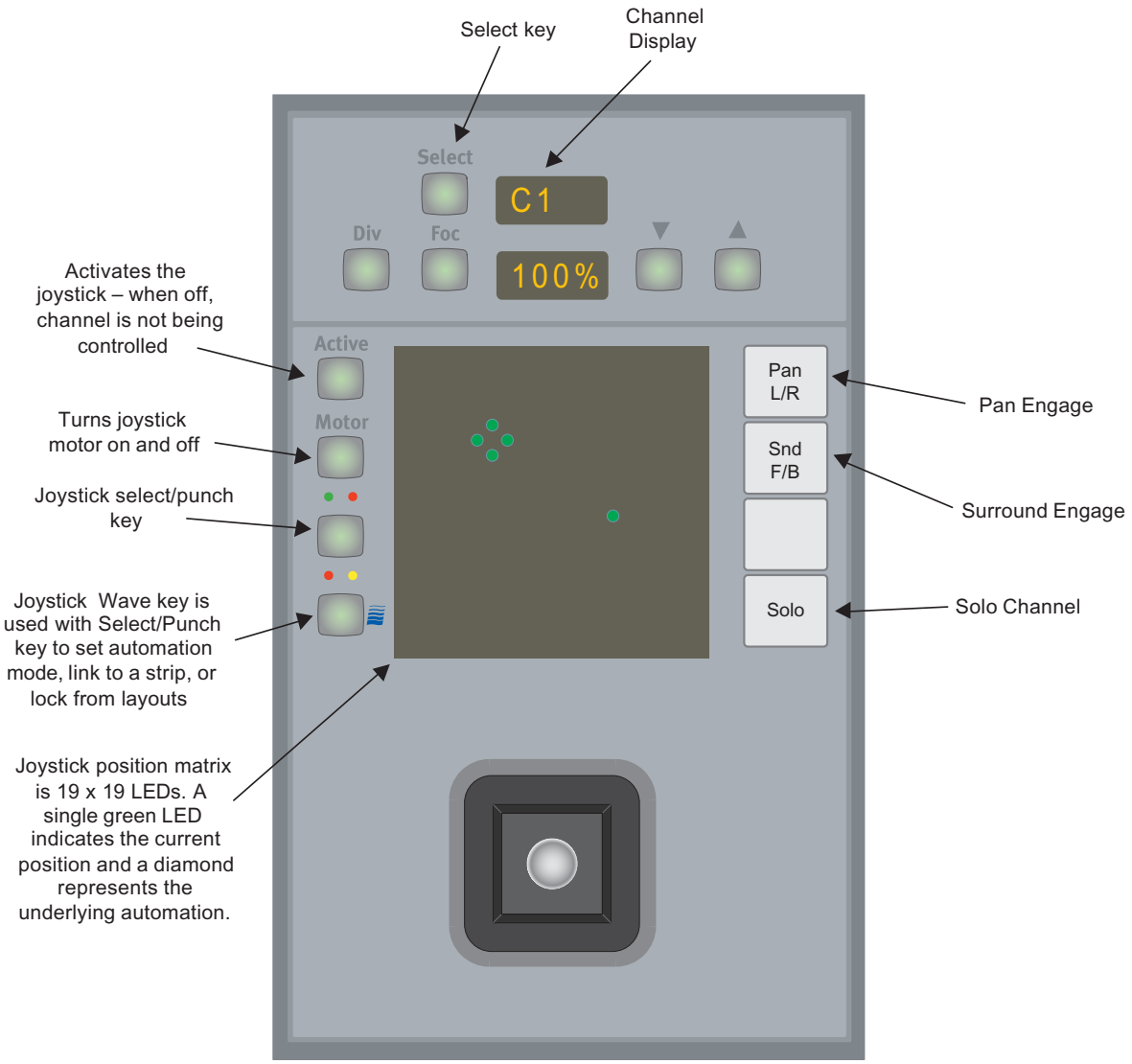

Select key
Channel Display
Select
C1
Div
Foc
100%
Activates the joystick – when off, channel is not being controlled
Active
Turns joystick motor on and off
Motor
Joystick select/punch key
Joystick Wave key is used with Select/Punch key to set automation mode, link to a strip, or lock from layouts
Joystick position matrix is 19 x 19 LEDs. A single green LED indicates the current position and a diamond represents the underlying automation.
Pan L/R
Pan Engage
Snd F/B
Surround Engage
Solo
Solo Channel

Figure 14-10 Joystick Panel controls

14.3.1 Assigning a Channel to a Joystick

Assign a channel to the joystick with the same key strokes used to assign a channel to a strip.

14.3.2 Linking a Joystick to a Strip

A joystick can be linked to a Strip on the console surface so any channel assigned to that Strip is automatically controlled by the joystick. This process uses a feature called **Strip Expand**, which is explained on page 101:

1. Press the **Strips** key from the **Main Panel** on the center section (CM401) to open the **Strip Config Panel** (Figure 8-4).
2. Press the **Strip Expand** key so it lights.
3. Press the **Wave** keys on the desired strip and the joystick.

   Both **Wave** keys will flash.

Assigning a new channel to that strip, either from the CM408 or the **Channel Select Panel** on the CM401, allows the joystick to control that channel.

Disable the link by pressing **Strip Expand** and the joystick's **Wave** key.

14.3.3 Layouts

Joystick assignments can be stored/recalled with Layouts and can also be protected from Layouts using **Strip Lock** in the **Strip Config Panel** (see page 101).

14.3.4 Setting the Automation Mode for a Joystick

Set the automation mode for pan and surround parameters controlled by the joystick the same as a standard strip: Hold down the joystick's **Wave** key and press its **Select/Punch** key repeatedly to cycle through the automation modes (**Isolate, Write Absolute, Read**).

The automation mode can also be set by pressing the desired automation mode key on the CM401 (i.e., **Write Abs**), which puts the console into a select mode. Then press the joystick's **Select/Punch** key.

14.3.5 Punching in a Joystick

Punch the joystick into record/write by pressing its **Select/Punch** key or simply move the joystick (it is always touch-sensitive) to automatically begin recording.

14.4 Multi-Operator Console

In a multi-operator post environment, the user experiences a single, large console that allows multiple operators. In reality, each section is a unique System 5 console, which allows a maximum number of channels per operator.

The Mix and Solo busses are normally linked across the consoles. Often the Aux and Group busses are not linked but are local to each operator. In a two-operator system, one console usually handles the FX and the other Music and Dialog.

Only one console, designated the *Master,* uses its monitor matrix. Each operator has a Post Panel located in their section. Although positioned near a particular operator's surface, each panel is connected to the Master console network allowing access to the monitor matrix.

14.5 Solo Linking

Although the consoles are almost entirely independent (i.e., file system, automation system, snapshots, group busses, etc.), the solo system can be linked across consoles by connecting the System PCs using the unused Ethernet port. This can be done via a small hub or a single crossover cable. Contact Euphonix customer support for more information.

14.6 Patching

The main patching issue with two-operator consoles is cascading the busses. This is done using the bus cascade inputs on the DSP core (version 2 and higher).

On the Slave Console:

1. Take the Bus Outputs and patch them to Device Inputs on the Studio Hub.
2. Take those Device Inputs on the slave console and physically connect them to Bus Cascade Inputs on the Master Console DSP core.

On the Master Console, the Bus Cascade Inputs are summed into the Master Console busses without requiring additional setup.

14.7 Machine Control

Film environments often require both operators to share control over the machines. A single TT007 can combine the machine control commands from two consoles.

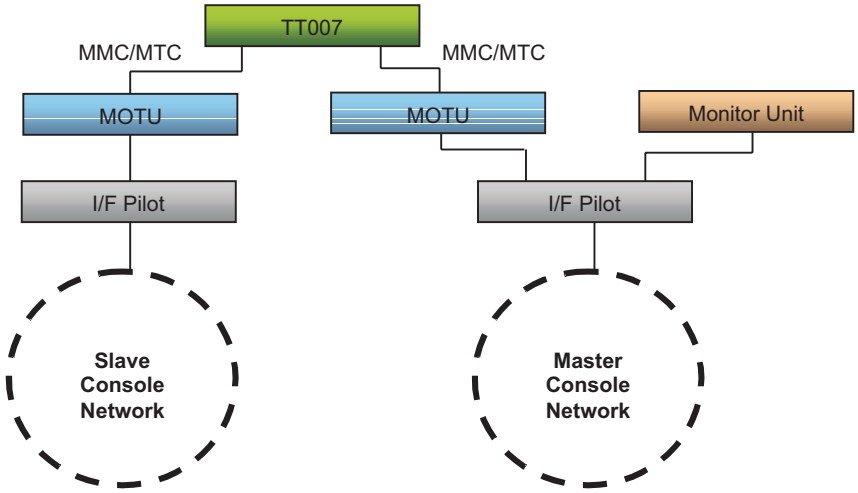


Figure 14-11 Master and Slave Console Hookup

14.8 Track Arming

Starting in v2.5, System 5 supported track arming to allow the user to track arm up to 48 tracks of a single machine via MIDI or P2. The 48 mix busses are hard-mapped to the 48 tracks. To support arming over multiple P2 machines (i.e., eight 6-track, six 8-track, or two 24-track machines), a third-party device that distributes 48 tracks from one P2 port to multiple P2 ports is required. Contact Euphonix customer support for more information.

14.9 Solo-In-Place

Whenever a channel is in solo, any sources currently assigned to the monitors are temporarily removed (i.e., externals and returns). The monitors automatically source the direct outputs from the console busses. When the channel is no longer in solo, the monitors revert to their setup prior to the solo.

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